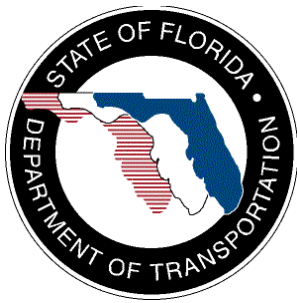


SunGuide®:

Project Staffing Plan

SunGuideSMD-PSP-5.0.0 (Draft)



Prepared for:

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List of Acronyms

CM	Configuration Management
DCP.....	Data Collection Process
DOT	Department of Transportation
FDOT	Florida Department of Transportation
FL-ATIS.....	Florida Advanced Traveler Information System
ITS.....	Intelligent Transportation Systems
ITN.....	Invitation to Negotiate
PM.....	Project Manager
QA.....	Quality Assurance
RM	Ramp Metering
SPM.....	Software Project Manager
SWA.....	Standard Written Agreement
SwRI	Southwest Research Institute

Revision History

Revision	Date	Changes
LOA001	July 15, 2010	Initial Release (DRAFT).
LOA001	July 19, 2010	Initial Release (FINAL)
3.0.0 Draft	September 15, 2010	Address comments from other process documents Update to reflect LOA002 Update to reflect LOA003 Update to add Valeriy Melnikov of Lucent Group
4.0.0 Draft	November 2, 2010	Update to reflect LOA004
5.0.0 Draft	November 10, 2010	Update to reflect LOA005

1. Scope

1.1 Document Identification

This document serves as the Staffing Plan (SP) for the SunGuide® Support, Maintenance and Development contract and addresses the staffing necessary to support Letter of Authorization 003. Later revisions to this document will address subsequent Letters of Authorization.

1.2 Project Overview

The Florida Department of Transportation (FDOT) SunGuide Support, Maintenance and Development Contract, contract number BDQ69, addresses the necessity of supporting, maintaining and performing enhancement development efforts to the SunGuide software. The SunGuide software was developed by the FDOT in a contract from October 2003 through June 2010. The SunGuide software is a set of Intelligent Transportation System (ITS) software that allows the control of roadway devices as well as information exchange across a variety of transportation agencies and is deployed throughout the state of Florida. The SunGuide software is based on ITS software available from the state of Texas; with significant customization and development of new software modules to meet the needs of the FDOT. Figure 1 provides a graphical view of the SunGuide software:

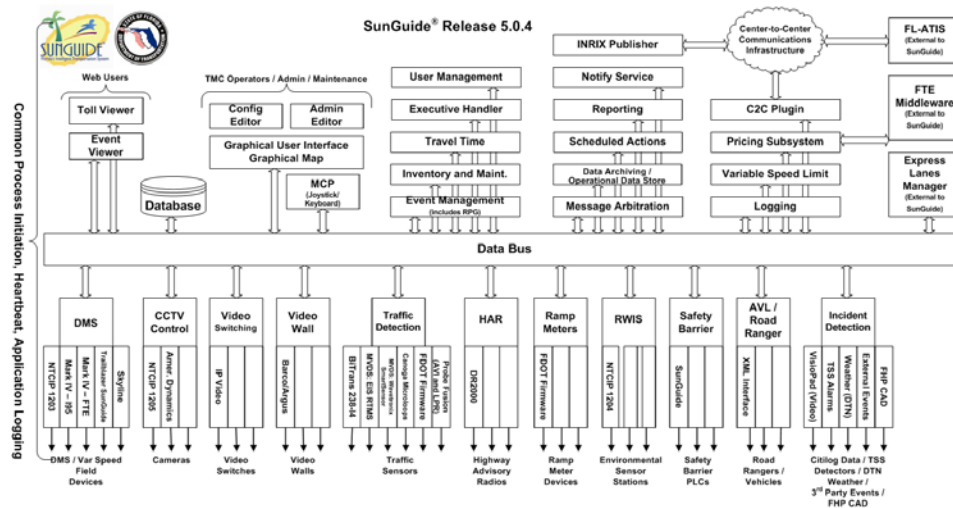


Figure 1 – High-Level Architectural Concept

1.3 Related Documents

Additional information regarding the SunGuide project can be found in the following documents and electronic publications:

- FDOT Scope of Services: *BDQ69, Standard Written Agreement for SunGuide Software Support, Maintenance, and Development, Exhibit A: Scope of Services*. July 1, 2010.

Project Staffing Plan

- Notice to Proceed: Letter to Southwest Research Institute® (SwRI®) for BDQ69, July 1, 2010
- Letter of Authorization 001: Letter to SwRI for BDQ69, July 1, 2010.
- Letter of Authorization 002: Letter to SwRI for BDQ69, August 3, 2010.
- Letter of Authorization 003: Letter to SwRI for BDQ69, August 19, 2010.
- Letter of Authorization 004: Letter to SwRI for BDQ69, October 20, 2010.
- Letter of Authorization 005: Letter to SwRI for BDQ69, November 9, 2010.
- SunGuide Project website: <http://sunguide.datasys.swri.edu>.

1.4 Contacts

The following are contact persons for the SunGuide software project:

- Elizabeth Birriel, ITS Section, Traffic Engineering and Operations Office Central Office, elizabeth.birriel@dot.state.fl.us, 850-410-5606
- Arun Krishnamurthy, FDOT SunGuide Project Manager, <mailto:arun.krishnamurthy@dot.state.fl.us>, 850-410-5615
- Khue Ngo, PBS&J Project Manager, khue.ngo@dot.state.fl.us, 850-410-5579.
- David Chang, PBS&J Project Advisor, david.chang@dot.state.fl.us, 850-410-5622
- Steve Dellenback, SwRI Management Advisor, sdellenback@swri.org, 210-522-3914
- Robert Heller, SwRI Project Manager, rheller@swri.org, 210-522-3824
- Tucker Brown, SwRI Software Project Manager, tbrown@swri.com, 210-522-3035

2. Staffing Plan

Throughout the development of SunGuide software, SwRI has utilized our rigorous project management approach to assure a quality product that is delivered within budget and schedule. To achieve this, roles have been established for key personnel.

Subsequent tables detailing staff assignments within the SwRI project staff contain the following information.

- Staff Member: name of the staff member.
- Labor Category: the following contains all labor categories¹ available to apply to staff as agreed upon in the SWA:
 - Administrative Assistant (AA)
 - QA Engineer (QAE)
 - Technician 1 (T1)
 - Technician 2 (T2)
 - Technician 3 (T3)
 - Programmer 1 (P1)
 - Programmer 2 (P2)
 - Programmer 3 (P3)
 - Programmer 4 (P4)
 - Designer 1 (D1)
 - Designer 2 (D2)
 - Designer 3 (D3)
 - Designer 4 (D4)
 - Analyst 1 (A1)
 - Analyst 2 (A2)
 - Analyst 3 (A3)
 - Analyst 4 (A4)
 - ITS Specialist 1 (IS1)
 - ITS Specialist 2 (IS2)
 - ITS Specialist 3 (IS3)
 - On-Site Programmer 1 (OP1)
 - On-Site Programmer 2 (OP2)
 - On-Site Programmer 3 (OP3)
 - On-Site Programmer 4 (OP4)
 - LGI Admin Assistant (LAA)
 - LGI On-Site Support 1 (LOS1)
 - LGI On-Site Support 2 (LOS2)
 - LGI On-Site Support 3 (LOS3)
 - LGI Technician 1 (LT1)
 - LGI Technician 2 (LT2)
 - LGI Technician 3 (LT3)
 - LGI Technician 4 (LT4)
 - LGI ITS Specialist 1 (LS1)

¹ Definitions of these labor categories are included in the SWA Exhibit C.

Project Staffing Plan

- LGI ITS Specialist 2 (LS2)
- Cambridge Analyst 1 (CA1)
- Cambridge Analyst 2 (CA2)
- Vanus Traffic Engineer Tech (VTET)
- Vanus Senior Traffic Engineer (VSTE)
- Percent Commitment: Percentage of time the staff member will dedicate to the project; commitments listed as “—” are available on an “as needed” basis.
- Columns indicate what activities each staff member has been assigned to work on for support or development activities.
- Task assignments may be one of three forms:

Lead Role:	♣	Contributing Role	●	Oversight	◆
------------	---	-------------------	---	-----------	---
- All project staff members are available in consulting, review, and advising roles to other staff members. Thus, staff may work on tasks to which they are not directly assigned.

2.1 Project Management

The SwRI Project Management and Administrative Support staff organization is depicted in Figure 2.

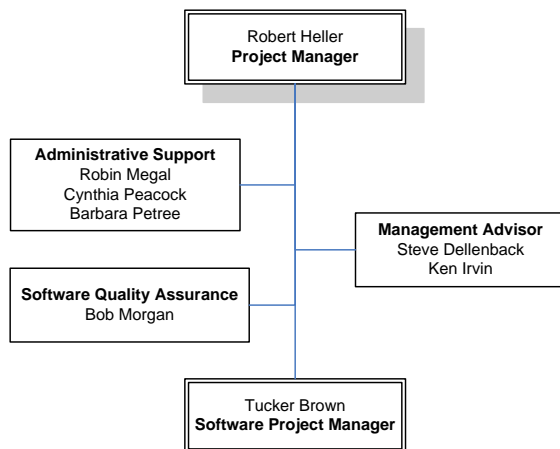


Figure 2 – SwRI Project Management Organization

- **Project Management:** Robert Heller is the SwRI SunGuide Project Manager (PM). Overall project management, which includes contractual issues, reporting and overall budget and schedule responsibilities are performed by the PM. In addition to these responsibilities, the PM is responsible for the oversight of the Software Project Manager (SPM), meeting on a regular basis with SwRI management, participating in quality assurance audits, allocation of staff and non-staff resources, etc. Heller has been with the project since the proposal and negotiations and has worked on the project since original contract award. Having a staff member with knowledge from the start of the program provides a stabilizing force and provides FDOT with the confidence that we are developing the software consistent with the existing architecture.

- **Software Project Manager:** Tucker Brown is the SwRI SunGuide SPM. Brown will be responsible for managing development activities, support functions, conducting team meetings, and performing configuration management of both software and documents for the SunGuide Project. Brown has been a developer on the SunGuide software for two years and was the lead for SunGuide Releases 4.1, 4.3, and 5.0. With Brown as SPM, some of the PM tasks offloaded to the SPM so that they can be accomplished within the cost and quality requested by FDOT.
- **Management Advisor:** Ken Irvin is the SwRI Section Manager responsible for the SunGuide project. Section Managers provide immediate management oversight to projects within the Automation and Data Systems Division/Intelligent Systems Department at SwRI. Irvin will provide oversight, assure adherence to process, monitor and review deliverables, and provide coordination with other Section Managers from whom SunGuide project staff are “borrowed.” Irvin and Heller review project schedule at regularly scheduled management reviews; Irvin provides management oversight of the project and reviews non-technical work products (e.g. status reports, staffing plan, etc.).

Steve Dellenback is the Director of the Intelligent Systems Department and is serving the SunGuide project as Senior Management Advisor. Dellenback was the SwRI Project Manager of record through completion of Release 4.1. Dellenback works with the Section Manager and Project Manager to assure FDOT expectations are met and SwRI continues to deliver a quality product. Dellenback also contributes to the project by serving as the SwRI representative to the Florida Advanced Traveler Information System (FL-ATIS) community through participation in telephone conferences.

- **Software Quality Assurance:** The PM meets with Quality Assurance (QA) Representative Robert (“Bob”) Morgan on a periodic basis. During those QA meetings, the PM and QA review compliance with the QA plan and ensure the department software process is being followed. This largely consists of the review of internal records regarding: management and team meetings, risks identification and tracking, requirements management, peer reviews, configuration management, and status accounting records.

All work products including software code, documents, status reports, etc. undergo a peer review by one or more staff members in coordination with the author. These peer reviews may be in the form of a management review, buddy check, or in the case of software code, a formal technical review. Technical work products are reviewed by technical peers of the author; non-technical work products are reviewed by SwRI management. Additionally, the PM routinely reviews design, deliverables, and presentations to assure that consistent “look and feel” and quality is provided to FDOT.

- **Subcontractor Management:** A subcontractor is a company or vendor who enters into a contract with SwRI and is provided a statement of work (scope), budget, schedule, and deliverables to be met. For support activities, Lucent Group will provide one staff member in a location to be determined by FDOT. This staff member will be trained by the SunGuide team and be responsible for on-site support of multiple deployments as well as installation and deployment support.

Heller and Brown frequently discuss and assess the PM tasks and needs and allocate responsibility for tasks between them. Furthermore, these discussions address:

Project Staffing Plan

- Tracking of PM tasks, Action Items and other project needs;
- Assessment of effectiveness and performance of the SwRI team;
- Identification of issues which may be better suited for input from SwRI management (Irvin and Dellenback)

Table 2-1 shows labor category, commitment and assignments for project management staff.

Table 2-1 – Project Management Staffing

	SG Labor Category	Commitment	Project Management Support	Om-Site Support	Deployment	Admin Support
Project Oversight:						
Steve Dellenback	IS3	5%	◆ ●			●
Robert Heller	IS2	25%	♣ ◆ ◆ ◆ ◆			
Ken Irvin	A3	5%	◆			
Tucker Brown	P1	50%	● ♣ ♣ ♣ ♣			
Administrative Support:						
Robin Megel	AA	—				●
Cynthia Peacock	AA	—				●
Bob Morgan	QAE	—				●
Barbara Petree	AA	—				●

2.2 Support Staffing Plan (LOA #001)

The Support, Maintenance, and Development contract has placed additional emphasis on maintaining the software and issue response times. As such, SwRI has allocated the staff that can maintain the level of support that FDOT desires. There are three main functions of the support staff: provide 24 hour per day, 7 days per week response to major failures² reported to the SunGuide support telephone line; provide on-site support to SunGuide deployments; and maintain the SunGuide software in response to issues entered into the Footprints database. Figure 3 contains an organization chart for the SunGuide support team.

² Critical failures, failures and external failures.

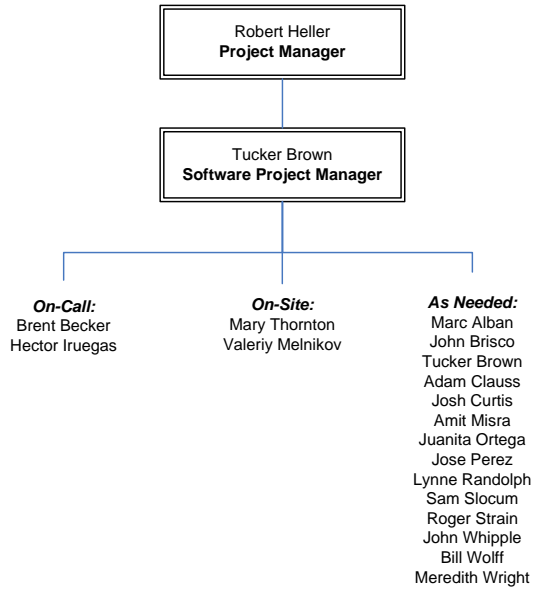


Figure 3 – LOA001 Support Organization Chart

Table 2-2 contains the staff members assigned to the SunGuide Support project and the roles they have been assigned.

Table 2-2 – LOA001 Support Staffing

	SG Labor Category	Commitment	Support	Om-Site Support
Developers / Support:				
Marc Alban	P2	—	●	
Brent Becker	T3	20%	●	
John Brisco	IS1	—	●	
Adam Clauss	P2	—	●	
Josh Curtis	P2	—	●	
Hector Iruegas	T2	50%	●	
Amit Misra	D1	—	●	
Juanita Ortega	P1	—	●	
Jose Perez	P1	50%	●	
Lynne Randolph	D1	—	●	

	SG Labor Category	Commitment	Support	On-Site Support
Sam Slocum	P3	—	●	
Roger Strain	D1	—	●	
Mary Thornton	OP2	100%	●	●
John Whipple	P2	—	●	
Bill Wolff	A1	—	●	
Meredith Wright	P2	—	●	
Valeriy Melnikov	LOS2	100%	●	●

2.2.1 On-Call Support Staff

The following sections describe how the support functions will be implemented. The SwRI Project Manager is responsible for assuring that the support staff meets the contract specified support requirements. See Figure 3 for the organization of the support staff. Support definitions, roles and responsibilities are described in the contract BDQ69 Exhibit A.

2.2.2 On-Site Support Staff

Mary Thornton serves as our District 5 on-site staff member. Thornton will participate in the installation of major software releases at sites throughout the state of Florida (she will focus on D5, D7, FTE Turkey Lake). When Thornton is not working on deployment or system issues, she will work on FootPrints issues that have been assigned to her. She will report to the SwRI Software Project Manager.

SwRI and Lucent Group will provide an on-site support staff member in Miami Florida. The Lucent Group staff member will be integrated into the SwRI support team and report to the SwRI Software Project Manager. SwRI and Lucent Group will provide SunGuide training to the Lucent Staff.

- The Lucent staff member will receive training in the operation of the SunGuide software.
- The Lucent staff member will receive training in the administration and configuration of the SunGuide software.
- The Lucent staff member will receive “SunGuide Developer Training.”
- The Lucent staff member will modify the SunGuide software with SwRI development staff oversight to resolve an existing Footprints Issue.

The Lucent on-site staff member will be provided:

- Direct access to SwRI development, support and project management staff (as if they were SwRI employees working on the SunGuide project).
- Access to the SunGuide software repository for resolution of Footprints issues.
- Access to the SunGuide project share utilized for sharing of project related information, documentation, and other resources.

The Lucent on-site staff member will be Mr. Valeriy Melnikov (resume in Appendix B).

2.2.3 SwRI San Antonio Based Support

The support function will operate in the same manner that it has been in the past. Support issues will be called into the SwRI provided “SunGuide support number³” or entered into Footprints⁴; the SwRI staff (led by Jose Perez) will assess the issue and will call on other SunGuide resources as necessary to address the issue. Jose Perez is the lead for addressing FootPrints issues and engages other San Antonio based SunGuide support staff as needed to address issues. In his role as footprints lead, Perez reports to the SPM.

Perez reviews performs initial review of all issues reported via the Footprints issue tracking tool. In this role, he assigns responsibility for an issue to himself or another SwRI support staff member.

2.3 SunGuide Software Installation and Training for Release 5.0 (LOA #002)

LOA #002 provides funding for SwRI to send trained support personnel for installation of SunGuide Release 5.0 at District 1, 2, 5, 6, 7, FTE, MDX, and Lee County. Figure 4 contains an organization chart for the SunGuide installation team.

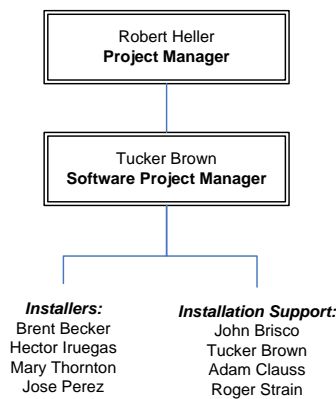


Figure 4 – LOA002 Installation Organization Chart

Table 2-3 contains the staff members assigned to the SunGuide Support project and the roles they have been assigned.

³ Critical Failures, Failures, External Failures

⁴ Defects, Configuration/Deployment, Enhancements

Table 2-3 – LOA002 SunGuide Installation Staff

	SG Labor Category	Commitment	Installers	Installation Support
Installers / Installation Support:				
Brent Becker	T3	100%	●	
John Brisco	IS1	—		●
Tucker Brown	P1	—		●
Adam Clauss	P2	—		●
Hector Iruegas	T3	100%	●	
Jose Perez	P1	100%	●	
Roger Strain	D1	—		●
Mary Thornton	OP2	100%	●	

2.3.1 Installation Staff

Staff responsible for SunGuide Release 5.0 will travel to the site of the installation and perform the necessary upgrades. Possible tasks for the installation include upgrade of a test database to Oracle 11.1.0.7, database script upgrades for the test system, SunGuide installation on a test system, initial testing on a test system for installation verification, upgrade of the production database to Oracle 11.1.0.7, database script upgrades for the production system, SunGuide installation on the production system, and initial testing on the production system. Installers will also perform training needed to operate the newest release of the SunGuide software.

2.3.2 Installation Support

Installation Support staff will be available to answer questions and address problem encountered by the installation staff. These staff will address any problems that occur in installation that would prevent the proper operation of the software. The staff member utilized will be determined be the issue topic. Additionally, installation support staff will prepare software hotfixes to be deployed by installations until fixes can be released as a patch or full release to the software.

2.4 INRIX Data Enhancement, Orlando-Orange County Expressway Authority (OOCEA), And Pensacola SunGuide Deployments (LOA #003)

LOA #003 provides funding for the following 3 tasks.

- INRIX Data Enhancement to SunGuide Software Release
- Orlando-Orange County Expressway Authority (OOCEA) SunGuide software deployment
- District 3 – Pensacola TMC SunGuide Software Deployment

Figure 5 contains an organization chart for the SunGuide development and deployment teams.

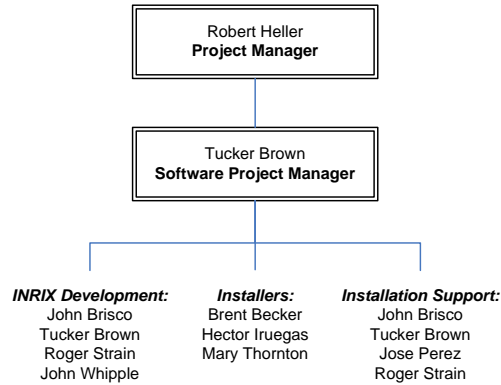


Figure 5 – LOA003 SunGuide Installers and INRIX Development Teams

Table 2-4 contains the staff members assigned to the SunGuide Support project and the roles they have been assigned.

Table 2-4 – LOA003 SunGuide Installers and INRIX Development Staff

	SG Labor Category	Commitment	Installers	Installation Support	INRIX Development
Installers / Installation Support:					
Brent Becker	T3	75%	•		
John Brisco	IS1	100%		•	•
Tucker Brown	P1	20%		•	•
Hector Iruegas	T3	100%	•		
Jose Perez	P1	100%	•		
Roger Strain	D1	50%		•	•
Mary Thornton	OP2	100%	•		
John Whipple	P2	50%			•

2.4.1 Installation Staff

Staff responsible for SunGuide Release 5.0 will travel to the site of the installation and perform the necessary upgrades. Possible tasks for the installation include, upgrade of a test database to Oracle 11.1.0.7, database script upgrades for the test system, SunGuide installation on a test system, initial testing on a test system for installation verification, upgrade of the production database to Oracle 11.1.0.7, database script upgrades for the production system, SunGuide installation on the production system, and initial testing on the production system. Installers will also perform training needed to operate the newest release of the SunGuide software.

2.4.2 Installation Support

Installation Support staff will be available to answer questions and address problem encountered by the installation staff. These staff will address any problems that occur in installation that would prevent the proper operation of the software. The staff member utilized will be determined be the issue topic. Additionally, installation support staff will prepare software hotfixes to be deployed by installations until fixes can be released as a patch or full release to the software.

2.4.3 INRIX Development

The INRIX development will involve creating a new subsystem that will gather INRIX data and use it to generate SunGuide C2C TSS data. The data can be used to monitor traffic conditions in areas that do not have currently deployed traffic sensors. INRIX data can be used to generate TVT data as well. None of this data can be redistributed to third parties so the data will have a special flag when distributed to data subscribers such as FL-ATIS.

2.5 SPARR, DMS Multi-Threading, EM Location Publish, Transcore Driver Update, and DMS Miles Ahead (LOA #004)

LOA #004 provides funding for the following 3 tasks.

- Road Ranger Smart Phone Application
- DMS Multi-Threading
- EM Location Publish
- Transcore Driver Update
- DMS Miles Ahead

Figure 6 contains an organization chart for the SunGuide development and deployment teams.

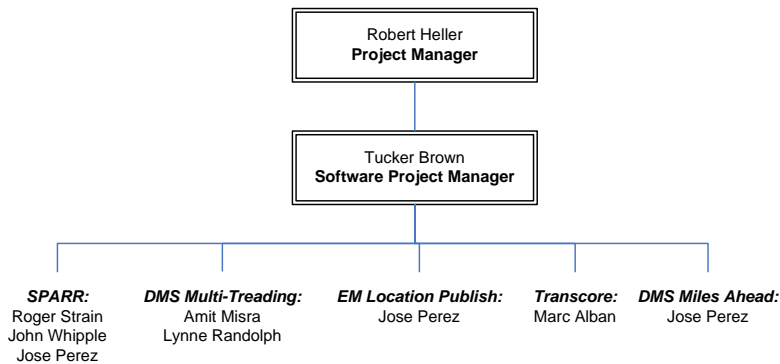


Figure 6 – LOA004 SunGuide Development Teams

Table 2-5 contains the staff members assigned to the SunGuide Support project and the roles they have been assigned.

Table 2-5 – LOA004 Development Staff

	SG Labor Category	Commitment	SPARR	DMS Multi-Threading	EM Location Publish	Transcore Driver	DMS Miles Ahead
Development:							
Marc Alban	P2	20%				•	
Tucker Brown	P1	70%	•		•		•
Amit Misra	D1	20%		•			
Jose Perez	P1	50%	•		•		•
Lynne Randolph	D1	20%					•
Roger Strain	D1	100%	•				
John Whipple	P2	100%	•	•			

2.5.1 SPARR

A new application will be developed for an Android Smart Phone that will act interact with the AVL system and allow Road Rangers to enter information into SunGuide. This effort will involve the development of an application for the Android operating system and a new driver to take information from the phone and communicate with SunGuide.

2.5.2 DMS Multi-Threading

The current version of EM does not support multi-threading to signs. This results in longer waits for timeouts in times of sign failures. With multi-threading, DMS will be able to send multiple requests at a time so DMS message updates will occur in a more timely manner.

2.5.3 EM Location Publish

A need has been established to allow the FLATIS system to distinguish between public and private EM locations for publication, as specified by the TMC operators. This enhancement will add a flag to the EM locations sent to FLATIS and will result in modifications to the EM and C2C subsystems as well as the Admin Editor.

2.5.4 Transcore Driver Update

This update will involve changing the driver protocol to optionally open a TCP connection as opposed to a UDP connection. The UDP connection uses a 1 byte identifier for the devices, limiting the maximum number of device to 255. With a TCP connection each device would get its own connection allowing an unlimited number of devices to be connected.

2.5.5 DMS Miles Ahead

Currently, TMC operators must calculate incident location distances manually and incorporate those results into the specified DMS messages. This update will utilize the existing RPG templates and the device linking files to generate the distance from the incident to the sign for inclusion in the message, thereby eliminating the need for manual calculation by the operators.

2.6 IntelliDrive Application Development (LOA #005)

LOA #005 provides funding for the development of the IntelliDrive applications

Figure 7 contains an organization chart for the SunGuide development and deployment teams.

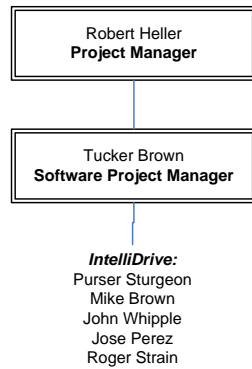


Figure 7 – LOA005 SunGuide Development Teams

Table 2-6 contains the staff members assigned to the SunGuide IntelliDrive project.

Table 2-6 – LOA005 Development Staff

	SG Labor Category	Commitment	IntelliDrive
Development:			
Purser Sturgeon	P2	50%	●
Tucker Brown	P1	50%	●
Mike Brown	D3	20%	●
Jose Perez	P1	50%	●
Roger Strain	D1	100%	●
John Whipple	P2	50%	●

2.6.1 IntelliDrive

The IntelliDrive effort will consist of developing a new subsystem, a new driver, and several GUI modifications to support the addition of IntelliDrive data into SunGuide. Once complete, SunGuide will incorporate the Basic Safety Message, Probe Vehicle Data Message, and Traveler Advisory Messages. The development work under this LOA will be demonstrated during the 2011 World Congress and provide other participating vendors access to additional SunGuide data via an expanded C2C interface.

Appendix A

SwRI Staff Resumes

(Note: Administrative Support Staff Do Not Have Resumes)

MARC ALBAN

Research Analyst

Intelligent Systems Department
Automation and Data Systems Division

M.S., Computer Science, University of Texas at Austin, 2008
B.S., Computer Science, Purdue University, 2006

As a Research Analyst in the Intelligent Vehicle System Section at Southwest Research Institute (SwRI), Mr. Alban has contributed to the SunGuide® traffic management system for the Florida Department of Transportation (FDOT). In addition to general enhancements and support for SunGuide®, he also led in the development of the data consistency and operational enhancements to the Express Lanes Subsystem. Mr. Alban worked on the Automated Vehicle Location and Road Ranger (AVL/RR) Subsystem and developed a Traffic Sensor Subsystem (TSS) device driver that processes and analyzes traffic data collected from Radio Frequency Identification (RFID) and license plate detection systems. Mr. Alban participated in integrating the Response Plan Generator Subsystem into the Event Management Subsystem to improve the maintainability and expandability of the SunGuide® code base. He consulted Closed Circuit Television (CCTV) camera manufacturers in achieving compliance with the National Transportation Communications for ITS (Intelligent Transportation Systems) Protocol (NTCIP) standard for camera control. He has also acted as the lead consultant for SwRI on the Ramp Metering project launch for FDOT District 6 in Miami.

Mr. Alban helped investigate alternative event management techniques in an internally funded research project. This work resulted in a functioning prototype of a more flexible and usable graphical interface for managing traffic events.

Mr. Alban is involved in a project to develop an advanced perception system for autonomous logistics vehicles to perform 3D stereo analysis and world modeling using low cost sensors and cameras. He is also working on small-scale robotic platforms for rapidly prototyping intelligent behaviors, specifically dealing with the interpretation of sensor data and indoor localization and mapping. His work in this area has included system architecture, sensor processing, graphical interface development, simulation, and the development of a rapid prototyping tool. Mr. Alban has also developed a graphical mapping tool which uses high resolution aerial photography to aid in defining and editing Route Network Definition Files (RNDF) used for route planning by the SwRI Mobile Autonomous Robotics Technology Initiative (MARTI) and other autonomous vehicles.

Prior to joining SwRI, Mr. Alban worked as an intern programmer at Paxar (now Avery Dennison), where he developed software tools for characterizing RFID hardware and tags being evaluated as possible components in future products. As a project leader for Purdue's Engineering Projects in Community Service (EPICS), Mr. Alban helped develop a content-searchable image database based on both user tagged keywords and automatically extracted image features.

Mr. Alban has experience in a variety of programming languages and frameworks, including C, C++, C#, Java, PHP, Python, Perl, SQL, XML, ROS, Qt, and MATLAB. He is skilled at developing for both the Windows and Linux operating systems.

PROFESSIONAL CHRONOLOGY: Paxar: intern programmer, summer 2005; EPICS: project leader, 2005-6; Southwest Research Institute: research analyst, 2008-present.

June 2010



J. BRENT BECKER

Group Leader

Intelligent Systems Department
Automation and Data Systems Division

M.S., Physics, Dartmouth College, 2000
B.A., Physics, Swarthmore College, 1992

Currently, Mr. Becker is Group Leader of the Sustainment Engineering (SE) Group in the Intelligent Systems Department (ISD). This Group supports the installation, integration and test of software projects developed within the Intelligent Systems Department at multiple deployments in several states. Additionally, the SE Group aids promotional activities whose work includes these supporting tasks. Mr. Becker is part of the team that administers and maintains the Hardware Development Environment for these projects, including multiple server and disk storage systems and their related Ethernet and video networking.

Mr. Becker's current focus is on Intelligent Transportation Systems communication engineering tasks for the state of Texas under the Texas Department of Transportation (TxDOT) Development, Integration, Implementation, and Maintenance Services (DIIMS) project. He is involved in the installation, integration and test of an Advanced Traffic Management System (ATMS) for TxDOT and has traveled throughout the state to deploy the system hardware and software in multiple configurations based on local District needs. As part of the installation and post-installation support, he has provided training to the local Operators, handled on-site and phone support for day to day software/hardware issues, and has worked to integrate and configure contractor-installed external hardware (CCTV cameras, Dynamic Message Signs, Radar Vehicle Detectors, etc.) with the system software. The project has also included design of an integrated video and data communications network for entities within Texas. Mr. Becker has also analyzed and prototyped wireless networks to support Intelligent Transportation Systems applications.

Mr. Becker's other work includes technical support for the Florida Department of Transportation's SunGuide® ATMS project. He is part of the team that provides 24/7 technical support and has been involved in software installations, hardware deployments, testing and configuration. Specifically, he has dealt extensively with the installation and configuration of the Center-to-Center software for data communications between the FDOT Districts and the Florida ATIS web site.

In addition, Mr. Becker is a member of the team supporting a system deployment for the Orlando Orange County Expressway Authority that collects, calculates and disseminates travel time information for Orlando and the surrounding area. He has worked with outside contractors in Florida to integrate and configure Automated Vehicle Identification readers and Dynamic Message Signs into this system. For this project he is also part of a 24/7 technical support team.

Mr. Becker's background is in experimental physics, information technology, and computer networking. He has significant experience working with micro-electromechanical systems from design to creation to interfacing with lab apparatus and instrumentation. He is also CompTIA A+ certified in computer systems and is experienced in LabVIEW, silver soldering, wiring and some C++ programming.

PROFESSIONAL CHRONOLOGY: Dartmouth College, research assistant, 1994-2000; Sony Semiconductor, business development engineer, 2000-4; Southwest Research Institute, 2005-[assistant technical specialist, 2005-6; technical specialist, 2006-7; engineering technologist, 2007-8; acting group leader, 2008; group leader, 2008-present].

June 2010



JOHN S. BRISCO

Staff Analyst

Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Science, Trinity University, 1983

Mr. Brisco has participated in the development of Intelligent Transportation Systems (ITS) software for the Texas Department of Transportation (TxDOT) and the Florida Department of Transportation (FDOT). He developed client and server applications used for testing device command and status communications between Traffic Management Center (TMC) servers, using command and status messages and responses in the Traffic Management Data Dictionary (TMDD) ITS national architecture format. He led the development of a Center-To-Center (C2C) interface for the TxDOT Advanced Traffic Management System (ATMS), and developed a status logging/viewing system used by TxDOT/Statewide applications and TxDOT ATMS applications. He has updated the C2C infrastructure applications to support additional data types and replaced the previous DATEX binary data exchange interface with an Extensible Markup Language/Simple Object Access Protocol (XML/SOAP) interface and supporting web service applications.

Mr. Brisco developed the traffic monitoring and control algorithms of a ramp metering system and the C2C interaction subsystem, a geospatial library and the incident detection subsystem (IDS) of the SunGuide® system for FDOT. He developed a tolling authority interface and a new data fusion subsystem of the SunGuide system for FDOT, and updated the C2C interaction subsystem and C2C Infrastructure for TxDOT. He has recently updated the SunGuide C2C interaction subsystem for publishing data to and retrieving data from a new statewide traveler information system being developed for FDOT and implemented enhancements to the event management and traffic sensor subsystems.

Mr. Brisco performed the software design and development of a system that allows emergency medical technicians in an ambulance to communicate with hospital emergency room physicians using a wireless Ethernet-based two-way video and audio conferencing system. This system was developed using high-end PCs and the Windows NT operating system. The teleconferencing system operates over spread spectrum radio and a fiber optic network.

Mr. Brisco led the software development of a telephone monitoring system for the U.S. Air Force. This application was originally developed using the C++ programming language in a graphical user interface environment hosted by the IBM OS/2 operating system. The completed system, consisting of a data acquisition and control unit connected with laptop PCs in LAN-based workgroup configuration, has been deployed worldwide. Since its initial release, the system has been updated to allow hot-swapping of the removable data drive, to detect, demodulate, decode and store fax data transmissions. The system has been re-hosted to the Microsoft Windows 2000 operating system and has been upgraded to support remote management of data collection.

Mr. Brisco also has extensive experience in the design and development of real-time data acquisition and process control applications. These applications have been developed on a wide variety of 8-bit and 16-bit embedded controllers and on PCs using several operating systems. These applications include an automatic wire connector crimping adjustment system for automotive wiring harnesses, an in-circuit emulation system for the development of operational mappings in automotive engine control units, and a tunnel detection system using borehole transceivers and automatic winch control. Mr. Brisco participated in the design and development of a high-performance blood pressure measuring system used during stress testing in a clinical environment, for which he was awarded a U.S. patent as a co-inventor of the system.

PROFESSIONAL CHRONOLOGY: Southwest Research Institute, 1983-[research analyst, 1983-1989; senior research analyst, 1989-2004; principal analyst, 2004-2008; staff analyst, 2008-present].

June 2010



TUCKER J. BROWN

Research Engineer

Intelligent Systems Department

Automation and Data Systems Division

B.S., Electrical Engineering, *Magna Cum Laude*, Texas Tech University, 2008

B.S., Computer Science, *Magna Cum Laude*, Texas Tech University, 2008

Mr. Brown joined the Intelligent Vehicle Systems Section following his graduation from Texas Tech University. He has worked on the Traffic Management System known as SunGuide® for the Florida Department of Transportation. In addition to development work, he has served as the lead for the preparation and testing of the system for formal acceptance testing. As a developer, Mr. Brown developed a set of test tools that allow a user to test the Center-to-Center (C2C) data being sent in and out of all C2C infrastructure components. He has also designed several interfaces for the Incident Detection Subsystem (IDS) to allow data from third-party sources to be processed by SunGuide®. The most notably of these was an application that processes Florida Highway Patrol data for accidents and filters the relevant data to each Traffic Management Center individually so that operators can have a better idea of where and when accidents occur that may affect traffic in their region. Mr. Brown also contributed to the development of the data consistency and operational enhancements to the Express Lanes Subsystem. Mr. Brown participated in the conversion of the Response Plan Generator (RPG) from Java to C# and moved the subsystem to be part of Event Management (EM). This enhancement was necessary for maintainability and future expansion of the response plans. He has also contributed to the support plan for SunGuide® by addressing bugs, failures, and enhancement requests from individual districts when needed.

Additionally, Mr. Brown was a part of an internally funded research project which investigated alternative event management techniques. From this research, a graphical user interface prototype for event management was created that was found to be highly flexible and user friendly.

Mr. Brown is also involved in the research of Mobile Robotics. He has worked on an internal research project building a generic architecture for a robotics controller. Mr. Brown has done work in autonomous vehicles where he designed an application for communicating between manned and unmanned vehicles for vehicle conveying operations. He has also done work on smaller robotic platforms. His work on these platforms has included fabrication new platforms, interfacing sensors to microcontrollers, design and implementation of intelligent autonomous algorithms, sensor and algorithm simulation, development of a rapid prototyping tool, and the development of a graphical user interface.

As an Electrical Engineering Intern at X-FAB Texas, Inc., Mr. Brown's responsibilities included operator interface development for hydrogen detection systems, solvent waste monitoring, scrubbed exhaust monitoring, and Wonderware SCADA Controls Interface maintenance and troubleshooting. He conducted a facility-wide ground fault coordination power study, where he designed one-line diagrams and TCC drawings in order to obtain fault current and incident energy values.

While working on student projects in the Texas Tech Electrical Engineering Project Labs, Mr. Brown was the project lead on several projects including an autonomously controlled GPS-navigated remote-controlled car and alternate applications for the Nintendo Wii Controller. He was also a team member on projects to create generic robot controller hardware for West Texas B.E.S.T. Robotics, and a wireless RF transmitter/receiver using discrete components.

Mr. Brown is skilled in the usage of C, C++, C#, Perl, UNIX, Assembly, XML, Orcad Suite, Eagle Layout Editor, MATLAB, Wonderware SCADA, SKM Power*Tools, Microsoft Word, Excel, PowerPoint, Project and FrontPage. He is proficient in analog and digital electronics, ground fault coordination studies, automation and controls technologies, and systems engineering (hardware and software).

PROFESSIONAL CHRONOLOGY: Texas Tech University, Electrical Engineering Project Labs: student projects, 2005-7; X-FAB Texas Inc.: electrical engineering intern, 2006-7; Southwest Research Institute: engineer, 2008-10; research engineer, 2010-present.

June 2010



MICHAEL A. BROWN

Principal Engineer

Intelligent Systems Department
Automation and Data Systems Division

M.S., Software Engineering, Southern Methodist University, 2003
B.S., Computer Engineering, Iowa State University, 1997

Mr. Brown has provided full system lifecycle engineering support for intelligent systems for over thirteen years. He has provided the architectural vision and developed a wide variety of intelligent systems software including device drivers, database access software, application server software, testing software, Center-to-Center software, on-board vehicle embedded software and Graphical User Interfaces for various operating systems and computer architectures. Mr. Brown has managed projects of various size and complexity and is currently a Principal Engineer in the Intelligent Vehicle Systems Section.

Mr. Brown is the Systems Lead for the Texas Department of Transportation Development, Implementation, Integration, and Maintenance Services (DIIMS) project. In this capacity, he oversees the design, development, deployment and maintenance of Intelligent Transportation Systems (ITS) to ensure consistency and reusability for the various ITS deployments in Texas.

Mr. Brown is currently managing and serving as system architect for SwRI's role in the New York State Department of Transportation – Commercial Vehicle Infrastructure Integration Project. For this project, SwRI is responsible for developing the On-Board Software for the only active IntelliDriveSM Commercial Vehicle project in the US. This project is enabling the exchange of information between the commercial vehicle, other vehicles, and an infrastructure using low-latency, secure communications (5.9 GHz DSRC). This project leverages software that he developed under SwRI research and development efforts to provide functionality for communications between a vehicle and an infrastructure and between vehicles. This software has also been utilized to enable cooperative vehicle behaviors such as vehicle platooning and cooperative convoys for IntelliDriveSM and military applications. Mr. Brown enhanced and integrated the software into the Kapsch 2009 ITS America Demonstration On-Board Unit to provide Green Speed functionality to recommend the optimal speed to proceed through a traffic signal given the current phase and timing of the traffic signal as well as the vehicle's position and distance from the intersection. Mr. Brown also utilized this software to develop the traffic signal preemption and prioritization functionality for the 2008 ITS World Congress on-board demonstration units. He serves on the Society of Automotive Engineers J2735 working group and helps define messages in the standard.

Mr. Brown is also the Software Architect for the Mobile Autonomous Robotics Technology Initiative (MARTI), an Internal Research Program focused on the investigation and development of technologies that could be used to augment a commercial-off-the-shelf vehicle platform to provide autonomous vehicle capabilities that can operate and perform specific tasks and improve safety in urban and trafficked environments. The software for the vehicle implements a 4D/Realtime Control System architecture to process sensor data from high-resolution cameras, LIDAR and a high-precision GPS/INS unit, and utilizes this data to intelligently command the vehicle and share information with an intelligent infrastructure and other vehicles. He has utilized this experience to serve as the software architect in the development of an advanced perception system for a military client. This system relies solely on low-cost electro-optical sensors to provide enhanced situational awareness for a vehicle.

Mr. Brown has experience working with various distributed computing architectures and inter-process communication using TCP/IP and UDP/IP in various programming languages. He is currently the chair of the National Transportation Communications for ITS Protocols (NTCIP) Center-to-Center communications working group, where he has used his knowledge to help define the standard for Center-to-Center communications using XML (NTCIP 2306).

PROFESSIONAL CHRONOLOGY: International Business Machines, Inc: development programmer, 1995; Southwest Research Institute: 1997-[engineer, 1997; research engineer, 1999-2003; senior research engineer, 2003-4; group leader, 2004-7; principal engineer, 2007-present].

June 2010



ADAM CLAUSS

Research Analyst

Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Science, Texas A&M University, 2005

Since joining Southwest Research Institute® (SwRI®), Mr. Clauss has served as a development team member and task lead developing Intelligent Transportation Systems software. He is currently participating in the development of a new browser-based user interface for the Florida Department of Transportation SunGuide® project. This effort modernizes the aging map used in the current version of the software to a new map designed similar to the Google Maps or Microsoft Bing map.

Mr. Clauss previously served as the design lead of development efforts on the SunGuide project. In this role, he was responsible for overseeing the design and integration efforts among the development team and their assigned tasks. His responsibilities included building several subsystems based on a generic subsystem and driver framework which uses extensible markup language (XML) for communication. His development duties included creating and enhancing subsystems and drivers for highway advisory radios, inventory and equipment maintenance, safety barrier devices, vehicles equipped with automatic vehicle locator devices (AVL), and Road Rangers. He also assisted in a significant architectural enhancement of the SunGuide user interface to improve performance and efficiency. In both the initial effort and a follow-up enhancement,

Mr. Clauss participated in the requirements development, design, and development of a subsystem to manage the tolling of express lanes. He was also responsible for extending the generic driver framework to allow for asynchronous and unsolicited communication from devices. He has participated and led multiple installations and upgrades of SunGuide at Traffic Management Centers. Tasks for these deployments included configuration of the operating system, installation of software, and integrating SunGuide with the devices at each site.

Mr. Clauss was the technical lead for a Lane Control Subsystem (LCS) in the Texas Department of Transportation (TxDOT) Development, Integration, Implementation, and Maintenance Services (DIIMS) project. As the lead, he oversaw the work of a group of developers creating a subsystem and three drivers to communicate to LCS devices as part of the Lonestar™ software. His development tasks on this effort included primary development of the LCS subsystem as well as a common library for the three drivers to share. He was also the core developer responsible for significant performance enhancements to Lonestar's Command and Status Distribution (CSD) process. This enhancement ensured that CSD could keep up with the data flow from a very large number of devices, most notably traffic detectors and travel time calculations, as Center-to-Center connectivity between deployments within TxDOT is increased.

Mr. Clauss has skills in a variety of programming languages including Java, C/C++, C#, ASP, ASP.NET, PHP, SQL, JavaScript and HTML. He also has experience with numerous operating systems that include Windows 95/98/NT/2000/XP/Vista/7, Windows Server 2003/2008, UNIX and DOS, including both 32-bit and 64-bit architectures.

PROFESSIONAL CHRONOLOGY: OSisoft: QA/Testing intern, 2004; Southwest Research Institute: 2005-[analyst, 2005-7; research analyst, 2007-present].

June 2010



JOSHUA J. CURTIS

Analyst

Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Science, University of Texas at San Antonio, 2007

Mr. Curtis joined Southwest Research Institute® (SwRI®) in early 2008 and is working on the Mobile Autonomous Robotics Technology Initiative (MARTI) autonomous vehicle program and the TransGuide C2C earmark effort. He is a pivotal member of the MARTI team, providing software expertise in the development of advanced algorithms within the MARTI behavior-based architecture. In particular, he has provided technical expertise in the processing of Laser Incident Detection and Ranging (LIDAR) sensor data and fusing this data with GPS data to generate a unified world model. He has been instrumental in several autonomous vehicle demonstrations including: the SwRI MARTI vehicle demonstration at the Intelligent Transportation Systems World Congress in New York City in November 2008 and the Robotics Rodeo technology demonstration in Fort Hood, Texas in August 2009.

Mr. Curtis has extensive experience using a variety of programming languages and libraries. These include the visualization toolkit (VTK) to aid in the development of 3D CAD model and point cloud segmentation algorithms for matching partial 3D scan data. In addition, Mr. Curtis has experience with C# and WPF which was used to develop a replacement map tool for the Florida Department of Transportation. Mr. Curtis has also used Qt lib for cross platform graphical user interface (GUI) applications and the ROS toolkit for advanced perception and autonomous vehicle applications. In addition, Mr. Curtis has experience interfacing with various hardware platforms such as: LIDAR, Prosilica cameras, radios, and CAC cards.

While completing his degree at the University of Texas at San Antonio (UTSA), Mr. Curtis served as the embedded systems programmer in a UTSA Computer Science Department Independent Study, which involved using Moteiv's Tmote SKY wireless sensors coupled with Lego Mindstorm Robots to simulate information gathering. Activities while Lead Programmer for Robot Communications included PC to Tmote sensor through serial port, using JAVA; Tmote sensor to Tmote sensor via wireless communication using TinyOS; and Tmote sensor to Handyboard through serial communication using TinyOS and Interactive C. During the summer of 2007, he was an intern responsible for streamlining and adding features to a nonlinear model of an ionized fluid consisting of ions and electrons. He also implemented ACML and LAPACK libraries; streamlined code by reading ASCII file input parameters which allowed for dynamic execution of codes; and was responsible for implementing IDL analysis codes to perform Fast Fourier Transforms on the output data to space and time. As a student intern in summer 2006, he modified a Visual C++ program, NewMusic, to increase its robustness by reading a central configuration file shared between several programs. He developed IDL data analysis software to visualize atmospheric neutral density data measured by CHAMP accelerometers; set up and maintained the small business network; developed a weekly code backup system for multiple-terabyte systems using PERL scripting and rsync; and was responsible for maintenance of computer hardware and software.

Mr. Curtis is proficient in Java, C++, Perl, PHP, MySQL and Oracle. He is familiar with C#, TinyOS, Visual Basic, IDL, HTML, LATEX, OpenGL, VTK and Microsoft Office, and has a working knowledge of UNIX, GNU/Linux and Win32.

PROFESSIONAL CHRONOLOGY: Southwest Research Institute: 2008-[analyst, 2008-present].

June 2010



STEVEN W. DELLENBACK, Ph.D., PM.P.

Director
Intelligent Systems Department
Automation and Data Systems Division

Ph.D., Computer Science, University of Kansas, 1985
M.S., Computer Science, University of Kansas, 1983
B.A., Computer Science, University of Texas at Austin, 1981

Dr. Dellenback has extensive experience in computer graphics, operating systems, programming languages, and systems design/integration. At the University of Kansas, his major areas of study included Computer Graphics, Operating Systems, Discrete Event Simulation, and Artificial Intelligence. His research work focused on graphics language design and implementation. As a research assistant, he headed an interactive graphics laboratory funded by the National Science Foundation for the study of human factors in interactive graphics environments.

At Southwest Research Institute® (SwRI®), Dr. Dellenback has been involved in a wide variety of programs ranging from microprocessor, assembly language-based development efforts to very large, integrated factory floor automation efforts. Many of his project efforts have focused on designing and developing applications which utilize a common set of source code but operate on a variety of computing environments.

Dr. Dellenback was the Project Manager and Lead Investigator on an automation project that developed a modular automation concept allowing one implementation of a software system to execute in multiple plants, each possessing unique process control equipment. He was a technical consultant on a variety of research grants for NASA which ranged from development of a custom programming language to investigation into software standards for future Mission Control Centers. He also served as Project Manager for an effort that evaluated and recommended replacement strategies for the Global Positioning System (GPS) control center at Falcon Air Force Base.

As Director of the Intelligent Systems Department, Dr. Dellenback oversees more than 65 staff members performing design, development, deployment and maintenance services for a number of clients including transportation agencies, vehicle manufacturers and organizations that utilize enterprise-wide software applications. He is a technical contributor to the Texas Department of Transportation (TxDOT) statewide integration project and the Florida Department of Transportation (FDOT) SunGuide® software project, which is developing an ITS application that will be used at all major transportation centers throughout the state of Florida. He serves as the Project Manager for the SwRI research program that is developing advanced technologies for autonomous vehicles, active safety systems, vehicle-to-vehicle communications and vehicle-to-roadside communications. He was both the Lead Technical Integrator and Project Manager for the TransGuide Model Deployment Initiative (MDI) for TxDOT.

Dr. Dellenback is chairman of the National Transportation Communications for ITS Protocol (NTCIP) Test and Conformity Assessment Working Group, and is a voting member on the NTCIP Joint Committee and the Traffic Management Data Dictionary (TMDD) Steering Committee. He is currently the vice-chair of ITS America's Coordinating Council. He has authored over 40 publications for both national and international conferences.

PROFESSIONAL CREDENTIALS: Project Management Professional.

PROFESSIONAL CHRONOLOGY: University of Kansas: instructor and research assistant, 1981-5; University of Texas at San Antonio: adjunct professor, 1985-9; St. Mary's University: adjunct professor, 1999-2003; Southwest Research Institute: 1985-[research scientist, 1985-8; senior research scientist, 1988-9; principal scientist, 1989-93; staff scientist, 1993-8; institute scientist, 1998-2006; director, 2006-present].

MEMBERSHIPS: Association for Computing Machinery, IEEE Senior Member, IEEE Computer Society, Sigma Xi, Upsilon Pi Epsilon, Project Management Institute.

June 2010



SOUTHWEST RESEARCH INSTITUTE



ROBERT W. HELLER, Ph.D.

Program Director
Intelligent Systems Department
Automation and Data Systems Division

Ph.D., Computer Science, Southern Methodist University, 1980
M.S., Computer Science, Southern Methodist University, 1977
B.A.S., Computer Science, Southern Methodist University, 1975

Dr. Heller is the Program Manager (PM) for the Florida Department of Transportation (FDOT) SunGuide® Software Program. SunGuide is an Advanced Traffic Management System that includes support for the 95EL managed lanes project in south Florida; dissemination of “fused” data for the statewide Advanced Traffic Information System in Florida; and comprehensive Event Management, which includes Road Ranger management, tracking and logging through mobile devices, support for various traffic detection devices including microwave, loop, tag readers and license plate readers, and other more common features. SunGuide is deployed in every DOT district in Florida and is planned for deployment to the Florida Turnpike Enterprise. Dr. Heller’s responsibilities include software development, testing, deployment and support activities.

Dr. Heller led a Quick Look Internal Research and Development (QL IR&D) which developed a technique enabling or disabling functionality in a graphic user interface for traffic event management. He led an IR&D project to improve travel times prediction algorithms when traffic sensors fail or known traffic patterns. He participated in a review of Traffic Management System software for Florida and Michigan. He managed the development of a data warehouse for the TranStar Traffic Management Center (TMC) in Houston, Texas. He also participated in activities that developed an Operational Concept Document, Software Requirements Specification, and Interface Control Documents for the next-generation Center-to-Center software for TxDOT.

Dr. Heller served as the Technical Coordinator and Software Project Manager (SPM) for the Department of Defense (DoD) Health Affairs Theater Medical Information Program (TMIP), performing systems engineering activities for future TMIP blocks and coordination of the efforts of software task leads in the integration of Government off-the-shelf applications and development of TMIP-specific software applications.

SwRI engineers under Dr. Heller’s management redesigned the A-10A Low Altitude Safety and Targeting Enhancement System. Motivated primarily by reliability and maintainability considerations, the SwRI team performed a technology insertion demonstration using 32-bit processors and the Ada programming language.

Dr. Heller managed a project team that assisted the San Antonio Air Logistics Center (SA-ALC) to acquire the F-15 Downsized Tester (DST). The SwRI project team, in conjunction with SA-ALC/LD personnel, developed the DST request for proposal, established a document library and made it available to prospective bidders, and acted as technical consultants to the Source Selection Technical Evaluation Team.

Other work at SwRI includes software development for an ambulatory blood pressure monitor and Small Sample Octane Number Measurement System; project manager for data reduction and analysis software for T/A-37, T-38 and F-5 aircraft maneuver Spectra; Independent Verification and Validation of the USAF Standard Memory Loader Verifier; and development of the Support Equipment Acquisition Management System, which automates MIL-HDBK-300 using ORACLE database. Dr. Heller has participated in several USAF Modular Automatic Test Equipment (MATE) projects which included software development effort for a MATE Test Module Adaptor (TMA); project management of MATE Operating System (MOS) re-host studies and efforts; consulting to ensure MIL-STD-1750A computer compliance; and participation in client proposal reviews for major MATE acquisitions.

While an assistant professor at the University of Tennessee at Knoxville, Dr. Heller taught graduate and undergraduate courses in computer hardware, software and networks.

PROFESSIONAL CHRONOLOGY: Southern Methodist University: 1975-80 (graduate assistant, 1975-80; visiting industrial professor, 1980); University of Tennessee at Knoxville: assistant professor of computer science, 1980-4; Southwest Research Institute: 1984-[senior research scientist, 1984-91; principal scientist, 1991-3; manager [acting], 1993-4; manager, 1994-6; principal scientist, 1996-2001; staff scientist, 2001-9; program director, 2009-present].

MEMBERSHIPS: Association of Computing Machines

June 2010



HECTOR IRUEGAS

Engineering Technologist

Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Information Systems, Chapman University, 2005
A.S., Science, Vincennes University, 2003

Mr. Iruegas is a member of the Sustainment Engineering Group in the Intelligent Systems Department at Southwest Research Institute® (SwRI®) after a successful career in the U.S. Navy. He is an experienced information systems technician, system administrator, and network manager.

Mr. Iruegas is currently involved with the Florida Department of Transportation (FDOT) SunGuide®, Orlando Orange County Expressway Authority (OOCEA), and Texas Department of Transportation (TxDOT) Development, Integration, Implementation, and Maintenance Services (DIIMS) projects. As a member of the SunGuide and OOCEA projects, Mr. Iruegas provides 24/7 technical support and has been involved in software installations, deployments, testing, and configuration. He also provides Operator and Administrator training to clients, as well as setting up and performing demonstrations to current and potential clients. In addition, he assists in the proposal process by preparing installation, hardware and labor cost budgets for potential clients. As the software installation technician for the TxDOT DIIMS program, he is responsible for subsystem installation, configuration, and testing. Further, he is responsible for setting up and performing TxDOT system demonstrations for current and potential clients.

Mr. Iruegas configures and maintains all project-related resources for project software development environments. This includes installation and maintenance of the department's Storage Area Network (SAN) Virtual Server Hosts, configuration of Microsoft clustered servers, and replication of FDOT SunGuide deployed software systems. He has experience installing Oracle Database 10g/11g, Oracle Client 10g/11g and Oracle Fail Safe 3.3.4 in both Windows 2003 and 2008 environments integrated with Microsoft cluster servers, as well as creation, backup and restoration of databases for the FDOT SunGuide project. In addition, he has experience with Acronis imaging software to replicate, backup and restore servers with minimum downtime.

Mr. Iruegas' prior work experience within the Information Technology industry has included positions as an Information Network Manager, Defense Messaging System (DMS) Administrator, and Information Systems Technician. These roles mandated managerial and leadership skills as well as extensive technical troubleshooting knowledge. He was responsible for writing disaster recovery plans, test plan documentation, and training manuals as a member of the United States Navy.

PROFESSIONAL CHRONOLOGY: U.S. Navy: 1997-2005 [information systems technician, 1997-2001; defense messaging system administrator, 2001-4; information network manager, 2004-5]; Southwest Research Institute: 2005-[engineering technologist, 2005-present].

June 2010



AMITABH MISRA
Senior Research Analyst
Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Science, University of Illinois at Chicago, 1998
B.A., Psychology, University of Illinois at Chicago, 1993

Since joining Southwest Research Institute®, Mr. Misra has gained ten years of experience in requirements development, design, software development, integration and maintenance of software systems. He has served in both a technical and managerial role on the design and development of small- and large-scale projects.

Mr. Misra has done extensive work for the Florida Department of Transportation (FDOT). He was responsible for designing and developing Dynamic Message Sign (DMS) device drivers, Closed Circuit Television (CCTV) device drivers and the Road Weather Information System (RWIS) device driver for the SunGuide® project. Additionally, he served as the project manager/software engineer for the FDOT I-95 Jacksonville ITS Expansion Phase III project. For this project, he developed and integrated the CCTV device driver and the National Transportation Communications for ITS Protocols (NTCIP) DMS device driver into the existing Jacksonville Advanced Transportation Management System (ATMS) software. He served as the task lead for the SunGuide I-95 Express Lanes project, which provides a managed lane solution that will allow toll rates to be varied on the Express Lanes based on the traffic conditions of the regular lanes.

Mr. Misra served as software lead for the Orlando-Orange County Expressway Authority (OOCEA) Data Server project. The purpose of the project is to gather traffic condition information, including Automated Vehicle Identification (AVI) data and DMS messages, and to supply traffic information both for internal OOCEA use and to external data customers such as the Florida 511 system. His duties included providing technical oversight of software development activities, tasking team members, and interfacing with stakeholders.

Additionally, Mr. Misra has managed and implemented many projects for the Texas Department of Transportation (TxDOT) Software Development Integrator (SDI™) program. Under the current contract, he serves as software developer, configuration manager, test lead, and assistant to the project manager. In prior SDI contracts, he was involved in developing and managing DMS Subsystem software which today is used by the various Traffic Management Centers across Texas to control DMS along the TxDOT expressways. He also served as a software lead on the Border Safety Inspection Facilities (BSIF) project, which involved the integration and automation of ITS technologies at eight locations along the U.S.-Mexico border in Texas.

Mr. Misra has been involved in the area of National ITS Standards. From 1999-2003, Mr. Misra served as a voting member on the following national standards committees: NTCIP DMS Working Group, NTCIP Profiles Working Group, NTCIP Base Standards Working Group, and NTCIP Global Objects Working Group. He served as a consultant to the National Electrical Manufacturers Association (NEMA) on the NTCIP DMS Working Group to develop a new release of the NTCIP 1203 DMS standard.

On a program for NASA, Mr. Misra helped develop Ground Support Equipment (GSE) software to capture data from a satellite as another satellite collided with a comet for the Deep Impact Program. In the area of software process, he served as the project manager of a large effort to convert the organization's software processes from Software Engineering Institute (SEI) Capability Maturity Model (CMM) Level 3 to Capability Maturity Model Integrated (CMMI) Level 5. His duties included managing a team of engineers to develop CMMI procedures, preparing for a Level 5 CMMI appraisal, and serving as Chair for the Software Engineering Process Group (SEPG). In February 2008, the organization achieved a CMMI Level 5 Rating.

Through Mr. Misra's formal education and work experience, he has acquired experience with multiple programming languages, operating systems, ITS equipment and network protocols.

PROFESSIONAL CHRONOLOGY: Southwest Research Institute, 1999-[analyst, 1999-2000; research analyst, 2000-4, senior research analyst, 2004-present].

June 2009



ROBERT P. MORGAN
Software Quality Assurance Engineer
Institute Quality Systems

B.B.A. in Personnel Administration, Texas A&M University, 1964
M.B.A. in Computer Science, Texas A&M University, 1970

Mr. Morgan is a software quality engineer in the Institute Quality Systems Department at Southwest Research Institute. He performs internal software quality assurance surveillances and is experienced in developing quality programs addressing the full range of software quality implementation, including policies, procedures, processes, standards, and methodologies. He has had over six years of experience as a quality assurance analyst and evaluator prior to coming to Southwest Research. Mr. Morgan has also had extensive experience in the development of systems training programs and has conducted a variety of courses and classes. He has been trained in the application of the Software Engineering Institute's Software Capability Maturity Model (SW-CMM) and the Capability Maturity Model Integration (CMMI), both sponsored by Carnegie Mellon University. He attended the SEI Software Engineering Process Group (SEPG) annual conference in 2005, 2006, 2007 and 2008. Overall, Mr. Morgan has over 25 years of systems and data processing experience in industry and in the United States Air Force.

Before joining Southwest Research Institute, Mr. Morgan evaluated the processes and then prepared plans for Research Dynamics, Inc., a San Antonio software development firm, as it began preparations for an SEI/CMM Level 2 assessment. Previously, he was a quality assurance evaluator at United Services Automobile Association (USAA) where he supported systems project teams with project management mentoring and coaching and performed assessments and evaluations. Mr. Morgan reviewed systems practices and revised development and maintenance methodologies as systems practices and techniques advanced. He performed a major rewrite of the Purchased Package Life Cycle methodology and was instrumental in its implementation.

While at USAA, Mr. Morgan conducted a series of programmer trainee courses of 10 weeks, with an average of 15 students in each class. In addition to teaching the material and conducting the actual training, he developed the exercises, handouts, and tests and graded the students on their performance. Mr. Morgan taught similar courses at RepublicBank Dallas. He was also in the systems training area at ARCO Oil & Gas.

At USAA, Fireman's Fund Insurance, and in the US Air Force at Kelly Air Force Base, Mr. Morgan participated in several major systems development projects as analyst and programmer. One project at USAA in particular stands out as it utilized IBM's then new Information Management System (IMS) database and was the initial use of that database management system for automobile policy issuance and maintenance.

PROFESSIONAL CREDENTIALS: Certificate in Data Processing, 1981

PROFESSIONAL CHRONOLOGY: U.S. Air Force: electronic data processing officer (captain), 1964-8; United Services Automobile Association (USAA): computer programmer and analyst, 1971-7; systems training specialist, 1978-81; RepublicBank Dallas: systems training manager, 1981-4; ARCO OIL & Gas: senior systems training specialist, 1984-6; Fireman's Fund Insurance: senior systems analyst, 1986-7; team leader and programmer/analyst, 1987-8; quality assurance evaluator, 1989-95; United Services Automobile Association (USAA): senior systems analyst, 1996-2000; Research Dynamics, Inc.: manager of Quality Management/Process Improvement, 2000; Southwest Research Institute: quality assurance engineer, 2002-present.

June 2010



JUANITA V. ORTEGA
Research Analyst
Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Science, Texas State University, 2005

Ms. Ortega is a Research Analyst in the Intelligent Systems Department currently assigned to the Next Generation SunGuide Map effort on the Florida Department of Transportation (FDOT) SunGuide® software project. The SunGuide map upgrade will result in converting a Scalable Vector Graphics (SVG) map to a Windows Presentation Foundation (WPF) map. On FDOT Ms. Ortega is responsible for creating over 35 device classes using WPF, writing the C# code to handle the display of icons, writing the C# code to connect the icons to their devices, and assisting with writing the C# code to connect existing dialogs to the new map.

Prior to her work on the FDOT project, Ms. Ortega worked as a Task Lead on the Improved Electronic Processor Unit (IEPU) project for the U.S. Air Force. As Task Lead on the IEPU project, Ms. Ortega and her team implemented new features to the IEPU using C, C++ and Jovial. The addition of these features was essential to help determine if unscheduled maintenance was required on the aircraft.

Ms. Ortega also worked on the Replacement Scheduling Application (RSA) project for the Veterans Health Administration (VHA). On RSA, she was responsible for ensuring RSA was compliant with Section 508 of the Rehabilitation Act. She used tools such as JAWS and JavaFerret to perform the analysis and her knowledge of Swing to implement changes. She was responsible for leading the GUI cross team to implement good design and usability principles. In addition, she designed and created reports using CrystalReports.

While working in the Space Science Division, Ms. Ortega assisted on two web projects, PIMS and PSS. As part of those projects, she helped automate the processes of creating and processing Waivers and Deviation and Material Planning Sheets. This required applying Usability principles and using MySQL, JSPs and Servlets to create the web pages.

She also worked on the Pharmacy Reengineering (PRE) project for the VHA. The PRE project involves the business process reengineering of the VHA's current pharmacy application. As a member of the presentation team, she used OOAD to develop the GUIs, UML notation and Rational Software Architect (RSA) to document the design, and Rational Requisite Pro to trace requirements. She was also responsible for developing the code using Eclipse and RSA, and for testing the GUI using Abbot and Costello. In addition, she assisted with automating GUI testing, the package structure creation process, and the generation of code stubs for individual screens.

On PRE she investigated, recommended and implemented configuration management strategies, a development environment, hardware and software. She installed and configured the servers and software for project development and tracking. As part of her activities, she created user and installation guides to facilitate knowledge sharing within the project. In addition, she developed a test and disaster recovery plan to ensure the reliability of the environment.

In an effort to facilitate code demonstrations for another project, Ms. Ortega automated the start-up process. She was able to eliminate the need for a start-up guide by reducing the process to a single click on each of the two machines.

Ms. Ortega has stayed current with User Interface Design and Usability principles by participating in the Human Computer Interaction Research Group. She is also a member of the Section 508 Accessibility Professionals, User Experience Group and User Experience Professionals Network groups.

Ms. Ortega's skills include C#, WPF, .NET, Java, Swing, C, C++, JavaFerret, Jovial, Lisp, Section 508 and Usability.

PROFESSIONAL CHRONOLOGY: Southwest Research Institute: 2004-[analyst, 2004-7; research analyst, 2007-present].

June 2010



JOSE L. PEREZ

Analyst

Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Science, Texas A&M University at Corpus Christi, 2008

Mr. Perez is a member of the Sustainment Engineering Group in the Intelligent Systems Department. He currently works on SunGuide®, a Traffic Management System for the Florida Department of Transportation. He is responsible for tracking and correcting issues with the software; whether it was an issue in configuration, database administration, or within the general software itself. He has experience working with multiple subsystems within SunGuide® including, but not limited to, AVL, Closed Circuit TV, DMS, Data Archive, Event Management, Highway Advisory Radio, Response Plan Generator, Reporting, Safety Barrier, TSS, and Video Switching. Aside from managing software issues post release and installation, Mr. Perez has also added functionality to the system, such as: porting RPG into EM, allowing Event Congestion to cross county lines, adding a FL-ATIS incident severity field to an Event to allow the transmission of that field over Center To Center, and adding a publish flag to CCTV, DMS, TSS, and TVT data. He has also aided in the administration and maintenance of the development environment for multiple software development platforms.

While attending Texas A&M University at Corpus Christi, Mr. Perez served as a Computer Science Grader/Tutor for three years. He was responsible for reviewing student code to assure students' ability to solve logical problems assigned by the professor and aided students in understanding fundamental computing science concepts and data structures. As a student, he participated in the creation of numerous custom applications including a business tracking system, numerous small applications, file submission websites, and inventory databases. He was also responsible for keeping constant communication between clients and other group members.

Mr. Perez has experience in a variety of programming and web development languages, including C/C++, Java, Visual Basic .Net, C#, Perl/Perl TK, Python, PHP, JavaScript and Lisp/Scheme. He is skilled at using Windows, UNIX and Linux operating systems and has experience with Oracle, Crystal Reports, MS Office 2003, MS Visual Studio.net 2003/2005/2008, IntelliJ IDEA, JCreator, Adobe Dreamweaver , Dev C++, mySql and IDLE.

PROFESSIONAL CHRONOLOGY: Southwest Research Institute: analyst, 2008-2010; research analyst, 2010-present.

June 2010



LYNNE A. RANDOLPH, PMP
Principal Engineer
Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Engineering, University of Cincinnati, 1999

As a member of the Institute's Transportation Information Systems Section, Ms. Randolph has contributed to both the Texas Department of Transportation (TxDOT) Development, Integration, Implementation, and Maintenance Services (DIIMS) Contract and the Florida Department of Transportation (FDOT) SunGuide® system. She is a voting member of the National Transportation Communications for ITS Protocol (NTCIP) Transportation Sensor Systems (TSS) working group and contributes to developing the standard.

Ms. Randolph is currently the software lead for the TxDOT DIIMS project. As software lead, she oversees the software architecture and design decisions for the Lonestarr™ suite and the border safety and commercial vehicle software processes. She has been instrumental in the development of components including a software administration application which abstracts user management, a process which collects data from various subsystems and combines them to create rules for alarms and alerts, and a contact notification application. Ms. Randolph is currently involved in the concept of operations for an emergency alert application for TxDOT and the design for software modifications to provide automated monitoring and reporting for software, communication, and device problems. She coordinates the efforts of software developers on the TxDOT project and provides architectural advice, troubleshooting assistance and mentoring. Her responsibilities as software lead also include peer reviewing Extensible Markup Language (XML) schema, reviewing and updating documentation, creating protocol documents, peer reviewing code, overseeing integration testing, and participating in design assessments.

Ms. Randolph has managed an internal research project to provide tools for more robust software development. This project created a library of tools for Self-Monitoring and Self-Healing (SMASH) software processes, including monitorable sockets and threads. When a problem is detected in a monitored component, data is collected and a repair is performed on the component. She has also managed an internal research project researching methods of incorporating disparate data sources onto a web page. This project incorporated Keyhole Markup Language (KML) to add data points to a map.

Previously, Ms Randolph was the system architect of the SunGuide software project which provides FDOT with a statewide traffic management center software system for control of roadway devices and information. She has made multiple contributions to the project including designing Extensible Markup Language (XML)-based ICDs, designing and developing components including the video wall system, traffic sensor system, a message arbitration system, and a template based travel time system. She was also responsible for designing a low-cost, efficient method for utilizing Dynamic Message Sign (DMS) font information to determine message formatting. She has developed an Operational Data Store (ODS) subsystem which archives traffic information including traffic detection data, travel times, DMS messages, 511 reporting information, device online time and process availability.

Ms. Randolph was instrumental in the development of a generic subsystem and driver framework in C#.NET. This framework includes support for socket communications, XML processing, logging, database connectivity and process status exchanges. As the framework was not developed under a specific project, this functionality is used to provide continuity for projects developed for various clients.

Ms. Randolph has skills in a variety of programming languages including Java, C/C++, C#.NET, Perl, CGI, PHP, JavaScript, HTML and assembly language. She also has experience with numerous operating systems that include Windows 95/NT/2000/2003/XP/Vista, UNIX and DOS. Other skills include XML, KML, SQL, JDBC, Java Swing, Rational Rose and Rational Requisite Pro. Ms. Randolph has experience with Oracle and SQL Server RDMS tools.

PROFESSIONAL CREDENTIALS: Sun Certified Programmer, Project Management Professional.

PROFESSIONAL CHRONOLOGY: Engineering Co-op, Structural Dynamics Research Corporation: engineering co-op, 1996-8; Southwest Research Institute: 1999-[engineer, 1999-2001; research engineer, 2001-4; senior research engineer, 2004-9; principal engineer, 2009-present].

June 2010



SAMUEL E. SLOCUM
Senior Research Analyst
Intelligent Systems Department
Automation and Data Systems Division

B.A., Chemistry, Our Lady of the Lake University, San Antonio, 1996

Mr. Slocum joined Southwest Research Institute® (SwRI®) in June 2005 and is currently in the Transportation Information Systems Section. He is currently working on a web based direction finding application utilizing an Oracle database. Previously he worked on the Texas Department of Transportation (TxDOT) Lonestar™ project team on the Development, Integration, Implementation, and Maintenance Services (DIIMS) program. This Advanced Traffic Management System (ATMS) project automates traffic operations for the Texas expressway system. Lonestar is composed of independent subsystems which are SQL Server Database driven C# applications. On the TxDOT project, Mr. Slocum designed and implemented subsystem components to provide timely notifications of system status changes via configurable delivery methods. The system is designed to allow easy addition of new delivery methods as they become available.

Prior to this, Mr. Slocum worked on the Florida Department of Transportation (FDOT) SunGuide® project helping build components to provide Center-to-Center (C2C) data to 511 systems. The components also manage incoming floodgate messages from Traffic Management Centers (TMCs) distributed throughout the state. Additional SunGuide related work has included designing and implementing a subsystem which controls the creation and distribution of audio files representing current traffic conditions for highways in the FDOT system. He also worked on a subsystem that manages data provided by traffic flow sensors. Using this aggregate data, it controls variable speed limit signs on highways within the FDOT SunGuide system.

Mr. Slocum previously worked as a member of the Pharmacy Re-engineering (PRE) Project team. This project for the Veterans Health Administration's (VHA) pharmacy system provides improved pharmacy services to the veteran population. He worked on efforts to decouple VistA packages from directly accessing pharmacy data files within VistA, aiding in transitioning to the new re-engineered PRE system.

Mr. Slocum is an accomplished software engineer with experience in requirements, analysis, design, development and testing. He has developed activity diagrams, scenario diagrams and sequence diagrams for project use cases using the Rational toolset and the Unified Modeling Language. In addition, he worked in a technical advisory role in preparing proposals for internal research projects by helping to formulate concepts concerning data visualization and document security. Previously, at the University of Texas at San Antonio (UTSA), he taught mathematics courses and managed the mathematics tutoring lab. Mr. Slocum is currently pursuing a Master's degree in Mathematics at UTSA. While working for Titan Systems Inc., Mr. Slocum developed applications providing an environment for the collaboration of military analysts. This application was primarily written in Java and connected to both an Excalibur database and a standard relational database (Sybase and Oracle). Additionally, he helped develop software for mapping and visualization software using Java.

While working for samission.com/GameMachine.com, Mr. Slocum developed a Perl and MySQL driven online newspaper system and maintained the company's networks and server. He also assisted in developing a number of Java and PHP based web games and a secure online gambling lottery system.

Mr. Slocum has experience with C, C++, C#, the .NET framework, Java, XHTML & CSS, JavaScript, Visual Basic Script, ASP, Perl, SQL, UNIX Shell Scripting, Apache, Oracle, Visual Source Safe, MySQL, PHP, Linux and FreeBSD system administration, and Microsoft Access.

PROFESSIONAL CHRONOLOGY: samission.com/GameMachine.com: database/system administrator, 1998-2000; Titan Systems Inc.: programmer, 2000-3; University of Texas at San Antonio: teaching assistant, 2003-5; Southwest Research Institute: 2005-[research analyst, 2005-9; senior research analyst, 2009-present]

June 2010



KENNETH D. IRVIN

Acting Manager

Intelligent Systems Department
Automation and Data Systems Division

B.S., Mechanical Engineering, Texas A&M University, 1980

Mr. Irvin serves as the Acting Manager of the Transportation Management Section, and specializes in and applies a variety of data management proficiencies, including data modeling; database administration; and extract, transform, and load methodologies. He has initiated and led a number of internal initiatives to advance related technologies, primarily involving the application of data mining techniques to identify predictive aspects in gathered instrumentation data for the enhancement or creation of decision support systems. He also has extensive experience with UNIX and MS Windows system administration and a variety of programming languages, as well as SQL and PL/SQL.

Currently, Mr. Irvin is serving as the Project Manager for the Alternative Dispute Resolution (ADR) Toolbox project. The ADR Toolbox project involves requirements elicitation, system design, implementation and testing, for a decision support system to facilitate mediation proceedings. Prior to this effort, he was the Database Team Lead for the Veterans Health Administration (VHA) Pharmacy Re-engineering (PRE) project. He has served as the Project Manager for the Subsurface Workflow Automation project, in which system requirements development and trade study execution efforts were performed for a major oil company. He also served as Software Project Manager of the Data Layer Team on the VHA PRE project and played a vital role in the associated proposal preparation, cost estimation, and project planning efforts. He also managed the development of the Pharmacy Enterprise Product System Data Migration Plan, which provided the framework for the data transfer between legacy and resultant database systems. Prior to these PRE project assignments, he was a member of the VHA Replacement Scheduling Application (RSA) project team, where he served as a lead engineer in the System Interfaces and Data Management Technologies Group.

Prior to joining Southwest Research Institute®, Mr. Irvin was an independent consultant where he made major contributions to re-engineering the software development process for the H. E. Butt Grocery Company. As a consultant, he also supported the Electronic Warfare Associates in the evaluation and recommendation of improvements to the Flagging Analysis System (FAS) for the Air Force Information Warfare Center (AFIWC). This support involved developing the technical proposal and, upon contract award, analyzing all aspects of the FAS, including the existing Oracle RDBMS installation and configuration, the implemented schema design, and the SQL and PL/SQL code imbedded throughout the system.

Before becoming an independent consultant, Mr. Irvin spent over twenty years employed in senior-level positions with several companies where he supported projects for the Air Intelligence Agency, the Joint Information Operations Center, and the National Aeronautics and Space Administration. This support involved a vast array of tasks, mostly involving database schema design, software development and database administration with respect to the Oracle RDBMS. In performing these tasks, Mr. Irvin has acquired in-depth knowledge and experience with most aspects of the Oracle RDBMS. In addition, he applied this expertise using a wide variety of platforms, operating systems, network configurations and software development tools. Over this timeframe, Mr. Irvin has taken many undergraduate and graduate level Computer Science courses to augment his technical expertise.

Early in his career, Mr. Irvin was involved in the mechanical engineering discipline, where he designed mechanisms and hydraulic and pneumatic devices, performed fastener installation stress analysis and executed material science research. He began his career as a draftsman involved with the design of manufacturing tooling for Air Traffic Control Radar and Paveway Missile projects.

PROFESSIONAL CHRONOLOGY: Huck Manufacturing Company: research engineer, 1980-2; McDonnell Douglas Technical Services Company: senior software analysis engineer, 1982-5; The MITRE Corporation: senior database engineer, 1985-98; ARINC Engineering Services, LLC: senior principal engineer, 1998-2003; Electronic Warfare Associates: principal software designer, 2003-4; Impact Innovations Group, LLC: consultant, 2004; Southwest Research Institute, 2004-[senior research engineer, 2004-5; group leader, 2005-6; manager, 2006-9; principal engineer, 2009-10, acting manager, 2010-present].
June 2010



ROGER L. STRAIN
Senior Research Analyst
Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Science, Louisiana Tech University, 1999

Mr. Strain is experienced in various computer science areas, with special interest in Internet technology. He is currently working on SunGuide®, a set of Advanced Traffic Management System (ATMS) processes for the Florida Department of Transportation (FDOT). For this project, he is the lead Graphical User Interface (GUI) developer, designing user interfaces that display detailed graphical information in a web browser. The platform integrates native Windows technology with HTML and JavaScript to provide an advanced user interface to Intelligent Transportation System (ITS) devices and systems. In addition to his user interface work, Mr. Strain has also assisted with the design, development and maintenance of back-room server processes that make up the SunGuide system, including taking concepts developed in the user interface and implementing them in server processes to allow uniform communication between processes which act like clients. He has also been actively supporting efforts to expand the use of SunGuide software to other states which may benefit from the technologies developed in the project, including Texas.

Mr. Strain is also managing software and system maintenance activities at TransGuide, the Texas Department of Transportation (TxDOT) ATMS in San Antonio. Before assuming the role of project manager, he performed a redesign of the TransGuide website, which included the addition of navigational graphics and aids, implementation of new functionality to view the status of the TransGuide system, and addition of a simple form for user feedback. Also for TransGuide, he developed a system to compute and display current travel times on Dynamic Message Signs (DMSs) throughout San Antonio. In addition to the DMS interface, he developed a web-accessible page to allow motorists to get the current travel times before leaving home. As part of the TransGuide project, he has helped transition the center away from using only custom software towards using the Texas statewide ITS software to further facilitate interoperability between Traffic Management Centers (TMCs) in Texas.

Mr. Strain has managed other projects at Southwest Research Institute (SwRI), including a company-confidential effort in conjunction with another SwRI division, and an internal research effort investigating technologies for monitoring and repairing complex software systems. This effort involved allowing software processes to report current status values related to each process and to define controls that can be invoked on them. This data was combined with information about the processes gathered from the operating system, then displayed together to give users a comprehensive view of the current state of the software system. If errors occurred in the system, the controls provided by managed processes could be invoked to correct the problems.

Mr. Strain assisted in the development of a Java-based DMS control subsystem for the TxDOT Statewide Integrator project, which is intended to provide a standard set of hardware and software for intelligent transportation projects in the state of Texas. He has also performed work on the Center-to-Center portion of the Statewide Integrator project. He helped design an XML communication protocol for ITS applications and created a prototype of a web-based user interface to examine and control ITS equipment.

Mr. Strain has experience in a variety of traditional programming languages, including C/C++/C#, Java, PHP and JavaScript, as well as strong knowledge of web technologies such as HTML, XML and SVG, and mobile operating systems such as iPhone OS and webOS. He has performed development work on many operating systems, including MS DOS, MS Windows, Solaris/SunOS and Linux.

PROFESSIONAL CHRONOLOGY: Southwest Research Institute, 1999-[analyst, 1999-2001; research analyst, 2001-5; senior research analyst, 2005-present].

June 2010



PURSER STURGEON II
Research Analyst
Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Science and Mathematics, University of Texas of the Permian Basin, 2004

Mr. Sturgeon is a member of the Intelligent Vehicle Systems Section within the Intelligent Systems (ISD) Department. He is currently contributing to a statewide integrator program for the Texas Department of Transportation. Within this program, he is the technical lead and developer for a project to automate and manage commercial vehicle safety screening in facilities along the Texas-Mexico border. The project includes systems to control traffic signals and dynamic message signs (DMS), read traffic sensors including Radio Frequency Identification (RFID) readers and Video Imaging Vehicle Detection System (VIVDS) detection units, and integrates with a vendor-supplied commercial vehicle weighing system. Mr. Sturgeon is also the primary developer for the subsystem that monitors, controls and helps automate the operations of the systems at the border facilities. Also under this program, he has helped develop an Extensible Markup Language (XML) interface testing application that allows more automated verification of internal and vendor-supplied systems to ensure that their external interface correctly conforms to the desired format developed for the respective system. He has also contributed to multiple projects related to the Federal Highway Administration's established IntelliDrivesSM initiative. These projects include integrating real-time, dynamic vehicle probe data into an advanced traffic management system from both standard light-duty vehicles and heavy-duty commercial vehicles, and include development on platforms ranging from standard PCs to PDAs to Linux-based Dedicated Short Range Communications (DSRC) radios. He has also developed the software for On-Board Equipment (OBE) and Road-Side Equipment (RSE) to enable vehicle-to-vehicle communications for a wireless adaptive cruise control system. The project provided a portable system that allows vehicles to form dynamic platoons on roadways to improve the safety and efficiency of the vehicles. Currently, he is the software lead on a project for New York State Department of Transportation to develop an IntelliDrivesSM system for commercial vehicles and to provide advanced warning of obstacles and other vehicles through vehicle-to-vehicle communications.

While a student at the University of Texas (UT) of the Permian Basin, Mr. Sturgeon spent two and a half years working in the Computer Science Research Lab as a systems and network administrator, responsible for user support, software installation, security, and ensuring lab functionality and usability for students. He also worked as a tutor for all offered computer science courses and several math courses at the University for two years.

During the last three semesters at UT Permian Basin, Mr. Sturgeon worked on two software projects, both covering the software development lifecycle, from requirements analysis to installation. The first project was an online Java applet that allowed users to create and edit Data Flow Diagrams (DFDs) using Unified Modeling Language (UML). On this project, he was primarily involved in the design and development of the application, specifically the user interface and input/output portions. On the second project he focused primarily on the development of a scripting engine for a piece of educational software and much of the project documentation.

Mr. Sturgeon is proficient in several languages including C#, Java, HTML, CSS, JavaScript, PHP and XML. He also has experience with C/C++, SQL and ASP.NET. His operating system experience includes Windows 98/2000/NT/XP, Solaris 9 and various Linux distributions.

PROFESSIONAL CHRONOLOGY: University of Texas of the Permian Basin: research lab assistant, 2002-4; Foundations Unlimited, Inc.: 2004; Southwest Research Institute: analyst, 2005-7; research analyst, 2007-present.

June 2010



MARY K. THORNTON
Research Analyst
Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Science, Armstrong Atlantic State University, 2002

Since joining Southwest Research Institute (SwRI) in 2003, Ms. Thornton has gained experience in the full lifecycle of the software development process, including requirements definition, design, interface implementation, testing, and maintenance activities.

Ms. Thornton currently serves as a development team member in the Transportation Information Systems Section. She provides application support and maintenance for the SunGuide® Advanced Transportation Management System (ATMS) project for the Florida Department of Transportation (FDOT). In this role, she has participated in numerous installations and deployments of the SunGuide software at Traffic Management Centers and locations across the state of Florida. Typically, tasks for deployments include configuration of the operating system, software installation, hardware and device troubleshooting, and training. Drawing on this experience, she managed a project in Lee County to install, configure, and provide training for the SunGuide system. She also provides on-site client support, software defect fixes and enhancements, software testing and documentation updates, and she assists with the collection and reporting of project metrics.

Prior to her involvement with the SunGuide project, Ms. Thornton assisted with both the Replacement Scheduling Application (RSA) and Pharmacy Re-engineering (PRE) projects for the Veterans Health Administration (VHA). She worked on the development of the presentation layer of the PRE project. The focus of her work was primarily to bring application storyboards to life in the Model-View-Controller pattern using Struts2. She also helped refine requirements and produce requirements documentation for both the RSA and PRE projects.

On RSA, Ms. Thornton led a development team that specialized in project interfaces and interacted extensively and effectively with the VHA client during the development of product interfaces. She designed, implemented, documented, tested and maintained multiple product infrastructure and interface components and developed acceptance and system integration test plans for RSA application interfaces. Additionally, she led the RSA project Configuration Management (CM) team in tasks that included tool support (help desk services and scripting using both Perl and Apache Ant), management of product configurations using the Rational Suite, monitoring of project repositories, product build and release management activities, server management, and development and maintenance of end user and process documentation.

As a member of the Systems/Software Process Improvement Group and the Capability Maturity Model Integrated (CMMI) Appraisal Team working toward CMMI Level 5, Ms. Thornton helped develop Measurement and Analysis and other processes. She also provided resources for the CM and Requirements Management process documentation and templates, and aided in the development of organizational software metrics.

Ms. Thornton is most familiar with JAVA, C++, Ada, C#, and C programming languages. She has worked extensively in MS DOS, Windows 3.x/95/98/NT/2000/XP, and Linux/UNIX operating systems. Her programming work uses a variety of technologies that include Oracle, PL/SQL, Swing, Java Web Services, Business Components for Java, Java Security, Java Messaging Service, HL7 messaging, HL7 CCOW interactions, .NET, BEA WebLogic, Apache Struts2, Struts Tiles, Java Server Pages, and both session and message-driven Enterprise Java Beans.

PROFESSIONAL CHRONOLOGY: U.S. Army: medical laboratory specialist, 1988-92; Chattanooga VA Outpatient Clinic: medical clerk/lab assistant, 1996; Armstrong Atlantic State University: student assistant, 1998-2002; Skidaway Institute of Oceanography: intern, 2002; Southwest Research Institute: 2003-[analyst, 2003-5; research analyst, 2005-present].

June 2010



JOHN G. WHIPPLE

Research Analyst

Intelligent Systems Department

Automation and Data Systems Division

B.S., Computer Science, University of Texas at San Antonio, 2006

Mr. Whipple began his career at Southwest Research Institute® (SwRI®) as a student analyst in 2004. He is currently a member of the Transportation Information Systems Section. Mr. Whipple is currently working on the Advanced Dispute Resolution (ADR) website for DRP Holdings, LLC. This website allows users to drag-and-drop icons, representing parties in a dispute, onto a canvas. Boxes can be drawn to indicate groups and arrows can be drawn between groups to indicate claims. Once the case profile is laid out visually, data from similar cases in the past can be analyzed to arrive at a settlement.

Previous to the ADR website, Mr. Whipple wrote a hardware driver that interfaced the Florida Department of Transportation (FDOT) SunGuide® Intelligent Transportation System (ITS) to the Jupiter Systems Fusion 964 Video Wall. The video wall and driver will be used for the viewing of traffic cameras on a large multi-projector displays in traffic management centers across the state of Florida. The driver interfaced existing SunGuide software with Jupiter's hardware using the ControlPoint command interface.

While working in the Space Science and Engineering Division, Mr. Whipple worked on support software for the Juno mission to the planet Jupiter. This Java-based web application helped scientists plan for the power levels and data rates required by the numerous instruments on board the spacecraft. Additionally, Mr. Whipple designed and implemented a job request tracking application for the Special Process Laboratory within the Space Science and Engineering Division. This group supplies services such as metal plating, printed circuit boards, vacuum forming and more. Their products range from office name plates to components of the Space Shuttle. Mr. Whipple's application allowed clients to create job requests that described the needed work and allowed a manager to calculate cost. Reports could be generated at the end of each period to summarize the transactions for each customer.

Mr. Whipple gained SmartPhone development experience when he designed and developed a prototype application and demonstrated it to a major insurance company. This application used the SmartPhone's GPS and mapping capability to detect when it was in a school zone. This so-called "School Zone Alarm" would sound an alarm when traveling over the speed limit in one of these school zones. As the driver slowed, the alarm would become less and less intense until the all-clear sound played, indicating an acceptable speed.

Mr. Whipple's served on the software maintenance team for the Veterans Administration (VA) Replacement Scheduling Application (RSA). He also contributed to an analysis effort to determine level of effort for the task of automating RSA test scripts. The varied tasks to which he has been assigned while on the RSA project have given him a broad understanding of Java technology.

Mr. Whipple is experienced in Java, Swing, JSP/Servlets, Android, GWT, C, C#, ASP.NET, Perl, Photoshop and SQL programming languages and is familiar with C++, MPI, OpenMP, Oracle, PHP/MySQL, R and VisualBasic.NET.

PROFESSIONAL CHRONOLOGY: Dew Drop Computing: founder and president, 1998-2004; Southwest Research Institute: 2004-[student analyst, 2004-6; analyst, 2006-8; research analyst, 2008-present].

June 2010



WILLIAM J. WOLFF
Principal Engineer
Intelligent Systems Department
Automation and Data Systems Division

B.S., Engineering Science (Electrical), Trinity University, 1982

Mr. Wolff has 27 years of experience in electronic systems development and project management, with an emphasis on intelligent transportation systems (ITS), test systems, and display systems. His ITS experience includes evaluation of ITS network architectures, evaluation of toll road equipment, development of conformance test methods, conversion of the Houston TranStar ITS to an Asynchronous Transfer Mode (ATM) backbone, and evaluation of communication techniques for roadside equipment. His test system experience includes development of electronic warfare test systems, functional replacement of military test equipment, configuration of industrial test systems, and development of test procedures. His display system experience includes development of vacuum fluorescent, electroluminescent, and video display subsystems for commercial and military clients.

Mr. Wolff is part of the Intelligent Vehicle Systems and Networks Section at Southwest Research Institute® and is currently supporting multiple ITS deployments for TxDOT. He has recently completed evaluation of toll road equipment for a commercial client. He developed conformance test methods for the trial use version of IEEE Std 1609.2-4, which describes the protocol used by the Dedicated Short Range Communications (DSRC) radio system being developed through the Vehicle Infrastructure Integration (VII) Program by the USDOT. The conformance test methods will be part of a certification program being developed by OmniAir, a consortium created to advance the deployment of DSRC by providing third-party certification services that ensure standards-compliance. Other recent efforts include managing the conversion of the communication infrastructure for the Houston TranStar ITS from an analog video network and T-1 data network to an ATM backbone that transports both video and data. This work builds on his earlier ITS experience, which includes evaluating techniques for relaying data to field devices [video pan-tilt-zoom (PTZ) controllers, dynamic message signs (DMS), system control unit (SCU), local control unit (LCU), etc.] over an ATM network using Ethernet switches and terminal servers, reviewing data communication requirements for the DMS subsystem development, and work on establishing the Low Power Television (LPTV) distribution system for the San Antonio TransGuide™ ITS.

Mr. Wolff was involved in the development of test procedures for a space mission; and developed and executed acceptance test procedures for the Theater Medical Information Program (TMIP). TMIP links information databases and integration centers so that medical data for military personnel is accessible anywhere, anytime, in any mission.

Mr. Wolff managed a multi-phase effort to implement the Sensor Arrow Collection System (SACS) for the Air Force Information Warfare Center (AFIWC). The SACS is used to characterize the response of advanced airborne electronic warfare systems during flight. The program included the development of an identification friend or foe (IFF) based multi-target tracking system with a video interface for real-time track display, development of a replacement blanking system for collocated receivers, a study of reliability and maintainability (R&M) problems, the re-design of portions of the system to address these R&M problems, and the preliminary design of the millimeter wave upgrade for the SACS.

Mr. Wolff designed a data capture and display system that provides a diagnostic display of data acquired by the AWACS Radar System. This functional replacement of an existing design achieved size, weight, cost, and noise reduction. Mr. Wolff also designed a display unit for a vehicle development instrumentation system for a major automotive electronics manufacturer that allows the operator to monitor vehicle operating conditions in real time.

Mr. Wolff configured vehicle electrical test systems for a major automobile manufacturer, developed and conducted classes on the configuration process, was involved in the development of an automated harness diagnostic system for the vehicle electrical test system, and collaborated on the failure mode effects analysis of a vehicle subassembly. At Motorola, Inc., Mr. Wolff resolved issues on the start-up of a high-volume electronics assembly line; developed automated production and quality control test software; and became a member of the new products management team.

PROFESSIONAL CHRONOLOGY: Trinity University: 1978-83 [engineering assistant, 1978-82; laboratory instructor, 1983]; Motorola, Inc., Automotive and Industrial Electronics Group: manufacturing engineer, 1983-4; Southwest Research Institute: 1984-[research engineer, 1984-90; senior research engineer, 1990-2006; principal engineer, 2006-present].

June 2010



MEREDITH R. WRIGHT
Research Analyst
Intelligent Systems Department
Automation and Data Systems Division

B.S., Computer Science, Baylor University, 2003

Ms. Wright has contributed to both the Texas Department of Transportation (TxDOT) Development, Integration, Implementation, and Maintenance Services (DIIMS) contract and the Florida Department of Transportation (FDOT) SunGuide® software project. For DIIMS, she supports and trains Intelligent Transportation Systems staff in the installation, testing and use of the Lonestar™ statewide subsystems and drivers. She also helps troubleshoot and upgrade systems, track and report issues, and participates in software development.

In addition to her experience with the TxDOT and FDOT projects, Ms. Wright participated in various Southwest Research Institute Internal Research (IR) projects. One IR project investigated methods of allowing a software process to repair itself without requiring external actions, and another IR project investigated the enhancement of Advanced Traffic Management Systems using Vehicle Infrastructure Integration data. She worked on a cooperative vehicle systems application in complex urban environments. She then participated in follow-on work for a major tolling systems integrator, adding a traveler information message handling component to the user interface. She also worked on an IR project and investigated ways to incorporate knowledge into object recognition, as related to computer vision. On another IR project, she helped build an abstraction framework that enables generic robot motion control capabilities and experimentally verifies the abstraction's performance in basic motion applications.

Similar to DIIMS, the purpose of the SunGuide project is to provide FDOT with a statewide traffic management center software library system to facilitate the control of roadway devices and information exchange across a variety of transportation agencies. Ms. Wright was a software lead for the Release 4.1 version of the SunGuide software featuring new travel time enhancements using probe sensors. She was responsible for managing the design, development and testing of this new series of enhancements. As a project integration lead for Release 3.0, she provided maintenance and support for the deployed system at the various FDOT districts, contributed SunGuide architecture expertise, trained new developers, analyzed and derived requirements for the system, designed and developed software interfaces, subsystem, and driver models, and oversaw testing and integration. She has assisted with SunGuide software deployments, providing setup, installation and testing for released software at client sites and troubleshooting hardware communications with the software. She has also presented in design reviews and has provided training for clients and subcontractors. Ms. Wright was a key developer in the Data Bus and other various driver and subsystem efforts. The Data Bus subsystem permits SunGuide software clients to select and retrieve distributed status data in real time and also enables clients to send command requests and receive responses. Some of the other processes that she worked on allow SunGuide software clients to send commands to display streaming video on the video wall and activate or deactivate layout, send commands to poll detectors and/or retrieve distributed detector status information, coordinate information provided by operators and other subsystems to generate suggestions for response plans, and control express lanes variable tolling.

She was instrumental in the development of a generic subsystem and driver framework in C#.NET. This framework includes support for socket communications, XML processing, logging, database connectivity and process status exchanges.

Ms. Wright has experience in a variety of programming languages including C, C++, C#, NET, Java, HTML, Pascal, Assembly, LISP, and Ada. She also has experience using the MS Windows 98/2000/NT/XP and UNIX operating systems, and Oracle and SQL Server database applications. She is also proficient in XML and XML schemas and has experience using the Rational Requisite Pro tool. She also served as a process specialist on the Software Engineering Process Group. As a member of the Process Improvement Working Group, she helped oversee the ongoing development and maintenance of organizational processes and process assets.

PROFESSIONAL CHRONOLOGY: Baylor University: student assistant, 2001; Southwest Research Institute: 2002-[student analyst, 2002-3; analyst, 2003-5; research analyst, 2005-present].

June 2010



Appendix B

Lucent Group Staff Resumes

(Note: Administrative Support Staff Do Not Have Resumes)

Project Staffing Plan

VALERIY MELNIKOV

B.S. Electronics, State Technical University named after Tupolev, Kazan, Russia
Computer Inf. Systems, State Technical University named after Bauman, Moscow, Russia
A.S. Computer Information Systems Analysis, MDCC, USA

SUMMARY

Proven record successfully completed projects for number of clients: Carnival Cruise Lines, Starboard Cruise Services, Universal Studios Orlando, Cap Gemini Ernst & Young, Chase, Stephen Gould Co., Hallmark Stevedoring. A wide range expertise in the integration, development for Accounting, Inventory, Asset Tracking, Receiving/Shipping, Time and Attendance, Pickup/Delivery.

SKILL SETS

Technologies: Visual Studio 2005 (VB, C#), Crystal Reports, SQL server (T-SQL), VB6, Access 2000, XML, ADO.NET 2.0, ADO, ASP, IIS, Windows Mobile, Windows CE.
Hardware: Symbol, Intermec: mobile devices, wireless access points, scanners, readers, RFID, tablet PCs.

EXPERIENCE

- MedEnvios Healthcare , Telemedia, Miami, FL Feb 2009 – present
Programmer
- Custom software development for Healthcare , Call centers supporting life and health insurance policies and reports for Management using Crystal Reports, SQL 2000 server programming T-SQL, VB6, VB.net 2005, Pervasive/Btrieve database, Access 2000
- Hallmark Stevedoring Co., Port of Miami and Port Everglades, FL 2006-Jan 2009
Analyst/Programmer, Software developer - Independent contractor
- Developed custom Accounting software for Payroll and Taxes (VB6,VB.net,C#, Crystal Reports)
 - Provided installation, testing, training and support
- Scanlynx Technologies, Inc. Fort Lauderdale, FL 2002-2006
Programmer/Analyst (Project manager)
- Developed software and hardware requirements after the initial gathering of technical and functional requirements from clients during discovery phase
 - Developed data dictionaries, user interfaces, data flow diagrams, and databases
 - As a Solution Partner for Symbol Technologies and Intermec performed product and software testing to formulate solutions to clients' specific requirements
 - Managed integration of custom developed mobile solutions to the existing information systems. Hardware included scanners, mag stripe readers, RFID readers, tablet PCs, barcode printers, and wireless access points.
- VSI International, Inc. Miramar, FL 2000-2001
Senior Programmer/Analyst
- Developed an application using VB, Access, VBA to retrieve and update data from SQL Server and Oracle databases. Created reports in Access
 - Developed EDI (Electronic Data Interchange) application to upload ASCII files into database
 - Developed dynamic Web pages to view data from databases using ASP, HTML, VB Script
 - Performed software and hardware installation: PointMan (Oracle based), SQL Server, MS Office, hardware drivers. Supported end users, performed Windows NT server backup
- Europartners databases, Inc. Miami, FL 1999-2000
Programmer/Database administrator
- Developed a client application for Windows using VB, MS Access, ADO, and DAO. The system enables a database administrator to maintain SQL server and Access databases.
- ELK Industries, Inc. Hollywood, FL 1997-1999
Programmer/Software developer.
- Developed inventory system using VB 5.0, MS Access, and Crystal Reports.
 - Performed hardware and software installations, setup and troubleshooting