

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Willim Michael Miller		POSITION TITLE Research Engineer Scientist	
eRA COMMONS USER NAME			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of Louisville, Louisville, Ky.	AAS	1972-1975	Engineering
University of Louisville, Louisville, Ky.	BS	1975-1979	EE. Engineering
University of Louisville, Louisville, Ky.	M.Eng	1978-1979	EE. Engineering
Sierra College, Rocklin, Ca.		1999-2001	Animation and Image Des.

**A. Positions and Honors.****Positions:****TEXAS INSTRUMENTS Electrical Design Engineer/ Systems Manager 1979-1996****System Test Engineer for Terminals and Peripherals, Houston, TX (1979-1981)**

Applied the use of vision robots for print quality inspection. Designed two modem testers, one automated keyboard tester, a monitor tester, and one terminal exerciser. Designs included hardware, software, and debug.

**PWB Test Section Manager for Terminals and Peripherals, Houston, TX (1981-1982)**

Coordinated all PWB functional and incircuit tests for the Terminals and Peripherals. Studied benefits of signature Analysis tools. Managed Capital Forecast, material expense, Statements of Work, and manpower forecast. Managed a team of seven electrical and software engineers and technicians. This team developed in-circuit and functional test for the 940 intelligent terminal and the silent 767 portable terminal.

**Electrical Design Engineer for Impact Printers, Houston, TX (1982-1986)**

Developed Open Loop Stepper Motor Algorithms used in TI 850/855 printers. Designed printhead drive circuits. Obtained patent on new printhead design circuit. Designed a 100 Khz switching power supply. Worked with vendors to customize motors.

**Electrical Design Engineer for Laser Printers, Temple, TX (1986-1987)**

Designed PWB controllers/engine interfaces for Texas Instruments initial laser printer offerings. Designed memory management ASIC's to enable the use of the GSP processors (tms34010) in laser printer.

**Electrical Project Engineering Manager, Temple, TX (1987-1992)**

- Managed an engineering team of 11 mechanical and electrical engineers in Laser Printer design and development processes including manpower, schedules, capital forecast, & Statements of Work.
- Design of System memory, Interfaces/Arbitrators, and RISC Architecture designs.
- Hardware Design Manager for the MicroLaser Laser Printer.
- Team leader for Product Definition working with Marketing, Production, and Service.
- Designed 25% of the ASIC used on the MicroLaser Laser Printer including the System memory Arbitration circuit to comprehend various banks and sizes of DRAM, System ROM, Font ROM, and Font Cartridges.
- Managed Turbo upgrade board for the MicroLaser.

**Research Team Manager, Corporate Ventures, Dallas, TX (1992-1993)**

- Built and Managed research team consisting of seven electrical engineers and technicians for a major research investment, DLP ( Project related to Digital Modulator Device Chip ).
- Coordinated software, algorithm, and electronic architecture development for prototype design.

Principal Investigator/Program Director (Last, First, Middle): Farag, Aly, A.

- Designed infrared LED programmable drive circuit in parallel with management duties.
- Participated at a high level on Product Definition, contributing my market experience in Printers, Displays and the consumer market in general.

Notebook Computer Options Project Design Manager/Engineer, Temple, TX (1993-1996)

- Managed three Docking Stations designs for the TM5000 Pentium notebook line and major sub-assemblies for the notebook family.
- Managed engineering team of eight employees, budgets (\$1.5M), schedules, Capital forecasts, and Statements of Work.
- Project Manager for revamp of troubled Docking Station Design.
- Responsible for Product Definition in tandem with Marketing, Production, and Service.
- Designed to Cost Analysis and proposed cost reduction plans of Docking Stations.
- Designed architecture for future Docking Stations.
- Also did some individual contribution work in 1993 before taking on the management role:
  - Wrote simulation scripts to debug and test ASIC while Managing the ASIC design.
  - Redesigned an older design ASIC for a cost reduction with added functions.
  - Designed Multimedia/PCMCIA printed wiring board (PWB) for TM5000 notebook.
  - Researched NTSC, S-Video for T.V. interface to Notebook Computers.

VERIFONE / HP Rocklin Ca. 1997-2001

Project Manager and Electronic Systems Hardware Manager for VeriFone Development Center in which I was a major catalyst in implementing design procedures and improving design process, as we moved VeriFone out of its entrepreneur design mentality into structured engineering practices.

- Worked closely with Marketing on the definition of new products.
- Built team from 10 to 21 Engineers in 18 months.
- Managed budgets (\$2M), schedules, Capital forecasts, and Statements of Work.
- Improved Engineering Practices by:
  - Establishing Cross Functional Detail Designs Reviews at Rocklin Facility.
  - Championing Production Readiness Check List.
  - Establishing clear PCB layout design practices, to eliminate ESD and EMI issues.
  - Leading Team through ISO 9001 Certification.
- Major role working with Marketing and Engineering in the Definition of the following POS terminals: the Omni 1450, the Omni 1220, the Omni 3500, the Omni 1460, the RF250, RF350, and Omni 3100 POS terminals.
- Managed/ co-managed the following POS terminals projects--Omni Modem 100, SC250, SC225, Omni 1250, Omni 1240, Omni 1220, Omni 1450, Omni 1460, Omni, RF 250, RF 350 and Omni 3200M.  
( Mag Card, Smart Card and modem interfaces were critical building blocks in these products. )
- Championed FPGA's and ASIC's starting with the Jaguar ( mag card reader/ power supervisor chip ) and leading to the system chip ASIC, which was a major objective I had set when I joined VeriFone.
- Managed Sustaining issues on the Petro Products. Also Consulted with Petro on a regular basis to brainstorm the development of new products.
- Immersed in Smart Card and Security Design issues for credit/smart card terminals.
- Led Wireless team : Designed/ proposed various wireless terminals for Mobitex, GSM, CDPD, CDMA, Bluetooth, WWAN and WLAN applications.

Sabbatical to Study Animation and Image Design: 2001-2003

Image Design Studying Animation combined with Music, Art, Graphic Design, (some Web Design applications).

UNIVERSITY of LOUISVILLE, Research Engineering Scientist and Adjunct Professor: 2004-Present

Enable and support 22 Grad Students in Biomedical imaging and Robotics. The Biomedical work encompasses the merging of CT slices into 3D images supporting and developing several analysis tools.

The Robotic development is of both a hardware and algorithmic nature in autonomous robotic work for robots traveling terrain in both the real and virtual world

- Specify/ install sensors, cameras, optics, software
- Design any equipment any fixturing necessary in the research environment
- Computer support
- Teach Electric Engineering Courses as needed

**Honors:**

- U.S. Patent # 4,735,517 "Printer with Flux Regulator" Co-Inventor 1987
- Elected Group Member of Texas Instruments Technical Staff in 1988.
- U.S. Patent for Improved Grounding Techniques for Printed Circuit boards 2000

**B. Selected peer-reviewed publications (in chronological order).**

1. A. Douce, W. Gaskins, D. Rosendaht, **W. Miller**, "New Power IC Regulates Electromagnetic Load Flux", Powertechics, Feb 1998.
2. H. Hassan, A. El-Baz, A. A. Farag, A. Farman, D. Tazman, **M. Miller**, "A Complete Volumetric 3D Model of the Human Jaw," *Proc. of Computer Assisted Radiology and Surgery (CARS)*, Berlin, Germany, June 22-25, 2005, pp. 1244-1249.
3. El-Baz, R. Fahmi, S. Esen Yuksel, A. A. Farag, **W. Miller**, M. Abou El-Ghar, T. Eldiasty, "A New CAD System for the Evaluation of Kidney Diseases Using DCE-MRI.," *Proc. of International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI'06)*, Copenhagen, Denmark, October 1-6, 2006, pp. 446-453.
4. H.Rara, S. Elhabian, Asem Ali, T. Gault, **M. Miller**, T. Starr, and A. Farag, "[A Framework for Long Distance Face Recognition using Dense- and Sparse-Stereo Reconstruction](#)," 5th International Symposium on Visual Computing (ISVC09), Nov. 30 – Dec. 2, 2009, Las Vegas, Nevada, USA.
5. H.Rara, S. Elhabian, A. Ali, **M. Miller**, T. Starr, and A. Farag, "Distant Face Recognition Based On Sparse Stereo Reconstruction," 2009 IEEE International Conference on Image Processing (ICIP), Nov. 7 – Nov. 10, 2009, Cairo, Egypt.
6. H. Rara, S. Elhabian, A. Ali, **M. Miller**, T. Starr, and A. A. Farag, "Face recognition at a distance based on sparse-stereo reconstruction," IEEE CVPR Biometrics Workshop, 2009.

**C. Research Support.** List selected ongoing or completed (during the last three years) research projects (federal and non-federal support).

Ongoing Research Support the last three years:

**1. "3D Modeling of the Human Jaw", NSF, 9/1/05 – 8/31/09**

**Goals/Description:** The purpose of this project is to develop volumetric 3D models of jaw teeth and gums for procedure simulations, using video and standard x-ray data. A registration technique is used to deform the matched tooth with our previous derived surface model. Combining this information with the jaw details and x-ray information of the roots, we can now derive a complete volumetric 3D model of the human jaw. This model will be employed for analysis which will include finite element work to analyze the stress and strain for different simulations. The simulations processes will include, among others, tooth-implanting and alignment.

**My Role:** As the CVIP Lab's staff Research Engineer for the lab, I am designing the CCD camera mechanism to fit with in a person mouth, lighting, and lense requirements. I am also designing any interim fixturing.

**2. "Novel Approaches in Perception for Autonomous Mobility" NASA-EPSCoR, 8/1/07 – 9/30/09**

**Goals/Description:** 1) Development of novel approaches for creating context sensitive labeled images for autonomous mobility; 2) Creating novel representations for reflexive and reactive behaviors; and 3) Evaluation of

Principal Investigator/Program Director (Last, First, Middle): Farag, Aly, A.

various approaches in perception mediated reactive behaviors.

**My Role:** design replica of jet aircraft fuselage section with refueling adapter and fit robotic arm with new camera and replica of jet refueling nozzle. Work with student to develop creating context sensitive image captures.

3. "3D Face Recognition – Phase II," EAW, 8/15/08 – 2/15/2010 (20% efforts).

**Goals/Description:** The purpose of this project is to implement a 3D face recognition system using integration of stereo and statistical SFS approaches of object reconstruction, and elastic registration methods. It is a continuation of the efforts from Phase 1 listed below.

**My Role:** Design, implement, and debug with EWA team stereo camera mechanism, with powered pan/tilt, zoom and baseline adjustments. Full automate capture algorithms, adding tracking and auto cropping. Analyze data and work with graduates student in algorithm developments for improving 3D reconstructions.

Completed Research Support the last three years:

4. "Perception-Based Robotic Navigation in Unknown Environments" NASA-EPSCoR, 10/1/06 – 9/30/07

**Goals/Description:** Develop a general, robust, and fast robotic navigation framework using level set methods for terrain and unknown planetary environments.

**My Role:** Design and debug modifications enabling the Lab's Trinocular vision platform to be mounted on Robotic vehicles to estimate elevation maps.

5. "Robot Path Planning Using a PDE Approaches", NASA-EPSCoR, 10/1/05 – 9/30/06

**Goals/Description:** Apply our centerline PDE approaches developed for virtual endoscopes to robotic Navigation.

**My Role:** I design and debug additional sensor installation and modification to our robotic platforms to enable the graduate students to develop new algorithms in path planning.

6. "Perception for Autonomous Mobility – Phase II", 09/22/03 – 3/31/05

**Goals/Description:** Create a real world platform to study planning, Fusion, and integration of sensors for designing autonomous robotic algorithms to be applied in the refueling of military vehicles.

**My Role:** I designed and debugged additional sensor installation and modification to our robotic platforms to enable the sonar, multiple synchronized LADARs, and multiple degrees of freedom.

7. "3D Face Recognition – Phase I," EAW, 8/1/06 – ongoing.

**Goals/Description:** 2D face recognition has reached a plateau in terms of performance with variations in illuminations, pose and expression. This effort funded by EWA and DoD Special Operations aims at discovering novel approaches for 3D face recognition to go beyond the limitations of 2D face recognition technology.

**My Role:** Design, implement, and debug with EWA team stereo camera mechanism, with powered pan/tilt, zoom and baseline adjustments. Analyze data and work with graduates student in algorithm developments for improving 3D reconstructions.