George Vikram Paul

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Objective

To work in an applied R&D, or engineering position which will be intellectually challenging and makes use of my skills. I would be particularly interested in robotics or automation, but am flexible.

Education

Ph.D. Robotics, November 1997.
Carnegie Mellon University, Pittsburgh, PA.

Thesis Title:	Kinematics of Objects in Contact using Dual Vectors and its Applications.
Research Interests:	Assembly Planning, Robot Task Level Programming, Computer Vision, Robot Control, Mechatronics.
Advisor:	Prof Katsushi Ikeuchi.

M.Tech. Electrical Engineering, December 1987.
Indian Institute of Technology, Madras, India.

Major:	Control Guidance and Instrumentation.
Project Title:	Synthesis of Cubic Polynomial Joint Trajectories for Robots and their Optimization.
GPA:	9.28/10.0 (Highest in class).

B.Tech. Electrical Engineering, May 1986.
College of Engineering, Kerala University, Trivandrum, India.

Project Title:	Design of a four degree of freedom Robot Arm.
Rank:	First in Electrical Engineering in Kerala University.

Research and Project Experience

Thesis Research, Carnegie Mellon University, 1990 - Present.
Developed the theory for representing the motion of objects in contact using dual vectors. I implemented the theory on the assembly plan from observation (APO) system. The system can observe a person perform an assembly task in front of a vision system, analyze the assembly task and program a robot to repeat the assembly task.

Image Understanding Environment (IUE) Project, Carnegie Mellon University, 1993 - 1996.
Developed and tested the C++ classes for matrix based Coordinate Systems and Coordinate Transforms. This involved the constructors and methods for all classes. The code is part of the current release of IUE.

Employment

Visiting Researcher, Institute of Industrial Science, University of Tokyo, May 1997 - Sep. 1997.

- Set up the Assembly Plan from Observation (APO) system in the University of Tokyo.
- Integrated a Force/Torque sensor into the Fujitsu direct drive robot arm system.

Teaching Assistant, Electrical Engineering, Carnegie Mellon University, Aug. 1992 - Dec. 1992.

- Lectured, graded and assisted students for “Introduction to Electrical Engineering”.

Summer Research Assistant, NEC Research Institute, Princeton, NJ, Jun. 1992 - Aug. 1992.

- Developed "A Fast Maximum Likelihood Minimum Discontinuity Algorithm for Stereo".

Visiting Research Scholar, Carnegie Mellon University, Pittsburgh, PA, Sep. 1989 - Aug. 1990.

- Designed and developed the graphical simulator for a multiple robot system called RobotWorld.
- Designed and developed the graphical user interface for the RFX light stripe rangefinder system.
- Developed the graphical user interface for the geometric modeling system called Vantage.

Scientific Officer, Indian Institute of Science, Bangalore, India, Feb. 1988 - Aug. 1989.

- Set up the Robotics lab at the Computer Science and Automation Dept. with the assistance of 3 scientific assistants and 5 lab assistants.
- Designed and built a 6 dof robot control system (ROBOCON).

Skills

Engineering

- Systems Integration: Assembly plan from observation system. Force sensor and control for Hitachi DD Arm. Multibaseline stereo system.
- Robot programming: RobotWorld, Puma, Hitachi DD arm.
- Real-time control system design and implementation.
- CAD: Built Vantage (geometric modeler) in C++.
- Modeling and simulation of physical systems.
- Mechatronics: Built 4 dof robot arm.

Programming

- Languages: C/C++, LISP, Pascal, Fortran, tcl/tk, assembly (80x51).
- Vision Software: IUE, AVS, VISTA.
- Mathematics Software: Mathematica, Matlab, LEDA.
- Graphical user interface, and physical system simulation development.
- Operating Systems: Unix, VXWorks, MS-DOS.
- Platforms: Sun, SGI, PC, Mac.

Project Leadership

- Supervising junior engineers and technicians.
- Strong writing, presentation, and interpersonal skills.

Representative Publications

Paul, G.V., and Ikeuchi, K., "A Quasi-Linear Method for Computing and Projecting onto C-Surfaces: Planar Case", Proceedings of the *IEEE International Conference on Robotics and Automation,* Albuquerque, USA, Apr. 1997.

Paul, G.V., Jiar, Y., Wheeler, M.D. and Ikeuchi, K., "Modeling Human Assembly Actions from Observation", Proceedings of the *IEEE/RSJ International Conference on Multi-Sensor Fusion and Integration for Intelligent Systems,* Washington D.C, USA, Dec 1996. *(Nominated for best paper).*

Paul, G.V., and Ikeuchi, K., "Modeling Planar Assembly Paths from Observation", Proceedings of the *IEEE/RSJ International Conference on Intelligent Robots and Systems,* Osaka, Japan, Nov 1996.

Awards

- Kerala University, Gold Medal 1986.
- NSF, Grant to attend the US-Japan forum on Robotics held in Japan for IROS-96.

Service Activities

- VASC Retreat Organizer, 1996: Organized the Annual Retreat for 120 people in VASC group.
- VASC Help Page Award, 1995: My WWW page on the RFX Rangefinder was voted best in VASC.
- AAAI Robot Competition, 1994: CMU team was placed second in the competition.
- IROS Conference, 1995: I was one of the volunteers from CMU.

References are available on request