Mark D. Wheeler

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Objective

A research position in either academia or industry enabling me to work on cutting edge problems relating to computer vision, graphics and modeling.

Research Interests

Computer vision. Object recognition and tracking. Pose estimation. Computer Graphics.
Object Modeling. Machine learning. Neural networks. Robotics. Computer Architecture.

Educational Experience

1989 – present , Carnegie Mellon University **Pittsburgh, Pennsylvania**

Ph.D. in Computer Science (expected), October 1996
Thesis: *Automatic Modeling and Localization for Object Recognition*
Advisor: Katsushi Ikeuchi
Support: National Science Foundation Graduate Fellowship
Area Qualifiers: Artificial Intelligence (Major), Computer Systems (Minor)
M.S. in Computer Science, 1993

1985 – 1989 , Tulane University **New Orleans, Louisiana**

B.S.E. *summa cum laude* in Computer Engineering, 1989
G.P.A.: 3.966/4.0
Honors: Tau Beta Pi, Eta Kappa Nu (electrical engineering),
Outstanding Senior in Computer Engineering
Scholarships: Deans' Honor Scholarship, Martin Marietta Foundation Scholarship

1987 – 1988 , Cambridge University **Cambridge, England**

Studied at Queens' College and the Computer Laboratory through the
Junior Year Abroad Honors program of Tulane University.
Completed the Computer Science Tripos, Part II (the final year of the B.A. degree).

1984 , Mississippi State University **Starkville, Mississippi**

Completed 6 credit hours during the summer session while still a junior in high school.

1981 – 1985 , St. Stanislaus College **Bay St. Louis, Mississippi**

High School Diploma
G.P.A.: 3.97/4.0
Honors: Salutatorian, Mathematics Award, Mississippi Governors School
Mississippi High School Math and Science Competition (1985): 1st Math, 1st Physics
Xavier University Math and Science Olympiad (1985): 1st Math, 2nd Physics, 3rd overall

Work Experience

Fall 1989 – present , Carnegie Mellon University **Pittsburgh, Pennsylvania**
Research Assistant, School of Computer Science
Provided programming support for the following research projects:
Vision Algorithm Compiler, ARPA Image Understanding Environment,
Automatic Target Recognition, and Learning From Observation.
Developed graphical user interface tools and I/O interfaces
for controlling a Unimation Puma robot, a range finder, and CCD cameras.

Summer 1989 , Martin Marietta Orlando Aerospace **Orlando, Florida**
Engineering Assistant, Guidance and Controls, Pershing Missile Program
Implemented guidance equation modules in Ada and created the interface between the modules and a flight simulator.

1988–1989 , Tulane University **New Orleans, Louisiana**
Senior Honors Project, Departments of Electrical Engineering and Computer Science
Analyzed the use of Iterated Function Systems (IFS) as an image compression method.
Designed and implemented an IFS image compression program with a graphical user interface on a Macintosh computer.

Summer 1988 , Martin Marietta Electronic Systems Company **Orlando, Florida**
Research Assistant, Guidance and Controls, Advanced Research Group
Designed and implemented algorithms to perform and statistically analyze deghosting in a tracking system using passive ranging. Coauthored technical report on the findings.

Summer 1987 , Martin Marietta Orlando Aerospace **Orlando, Florida**
Engineering Assistant, Reliability Engineering, LANTIRN Program
Responsible for summarizing failure analyses and maintaining a database of failures to identify problem areas on the LANTIRN system.

Summers of 1985 and 1986 , Martin Marietta Michoud Aerospace **New Orleans, Louisiana**
Engineering Assistant, Systems Engineering, Space Shuttle External Tank Program
Responsible for the maintenance of systems level drawings. Prepared flight readiness review charts describing engineering changes affecting systems level components of the External Tank.

Systems and Programming Language Experience

Programming Languages: C, C++, LISP, Ada, Fortran
Graphical User Interfaces: Tcl/Tk, Motif, Xview, Phigs, Xlib
Hypertext Programming: HTML, CGI Scripting
Systems: UNIX, Sun Workstations, Silicon Graphics Workstations, Macintosh Computers, TCP/IP

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Teaching Experience

Carnegie Mellon University — Pittsburgh, Pennsylvania

Teaching assistant for Professors Katsushi Ikeuchi, Martial Hebert, and Eric Krotkov's undergraduate/graduate *Computer Vision* course. Gave some lectures, formulated and graded projects, assignments, and exams.

Teaching assistant for Professor Daniel Siewiorek's undergraduate *Computer Architecture* course. Gave some lectures, formulated and graded projects, assignments and exams. Led weekly recitations.

Gave a lecture for Professors Katsushi Ikeuchi, Martial Hebert, and Steven Shafer's Advanced Perception graduate course in the Robotics Institute.

Publications

Refereed Journal Publications

Mark D. Wheeler and Katsushi Ikeuchi. Sensor Modeling, Probabilistic Hypothesis Generation, and Robust Localization for Object Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence*. Volume 17, number 3, pages 252-265, March, 1995. (Earlier version appeared in Second CAD-Based Vision Workshop, February 1994, Champion, Pennsylvania)

Mark D. Wheeler and Katsushi Ikeuchi. Iterative Smoothed Residuals: a Low-Pass Filter for Smoothing with Controlled Shrinkage. *IEEE Transactions on Pattern Analysis and Machine Intelligence*. Volume 18, number 3, pages 334-337, March 1996.

Other Publications

Katsushi Ikeuchi, Takeshi Shakunaga, Mark Wheeler, and Taku Yamazaki. SAR Target Recognition based on Invariant Histograms and Deformable Template Matching. IEEE Conference on Computer Vision and Pattern Recognition, 1996. To appear.

Mark D. Wheeler and Katsushi Ikeuchi. Iterative Estimation of Rotation and Translation using the Quaternion. Technical Report CMU-CS-95-215, School of Computer Science, Carnegie Mellon University, December 1995.

S.B. Kang, M.D. Wheeler, and K. Ikeuchi. 3-D object tracking and human grasp recognition for robot programming by demonstration. Workshop on Vision for Robots, Pittsburgh, Pennsylvania, August 6, 1995, pages 37-44.

Katsushi Ikeuchi, Takashi Suehiro, Peter Tanguy, and Mark D. Wheeler. Assembly Plan from Observation. Annual Research Review, the Robotics Institute, Carnegie Mellon University, 1990.

Talks

"Sensor Modeling, Probabilistic Hypothesis Generation, and Robust Localization for Object Recognition," Second CAD-Based Vision Workshop, February 1994, Champion, Pennsylvania.

Professional Activities

Referee

IEEE Transactions on Pattern Analysis and Machine Intelligence
International Journal of Computer Vision
Computer Vision, Graphics and Image Processing: Image Understanding
IEEE Transactions on Robotics and Automation
International Conference on Computer Vision
IEEE Conference on Computer Vision and Pattern Recognition

Others

Artificial Intelligence Qualifier Oversight Committee, Carnegie Mellon (1994).
Organized a three day retreat for the Vision and Autonomous Systems Center of Carnegie Mellon University (1992).

References

Katsushi Ikeuchi, Principle Research Scientist
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Department of Information Technology
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Other Info

Citizenship: US