# KATHLEEN A. ROMANIK

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## PROFESSIONAL EXPERIENCE:

**National Institute of Standards and Technology** - Gaithersburg, MD (7/96-present)
**National Research Council Research Associate** - Design hierarchical terrain models for unmanned vehicle navigation.

**University of Maryland Center for Automation Research** - College Park, MD (3/96-present)
**Visiting Researcher** - Developed optimization strategies for beacon placement in robot localization. Designed a practical approximation algorithm for a robust line estimator.

**DIMACS Center for Discrete Mathematics & Theoretical Computer Science** (9/94-2/96)
**University-Industry Research Fellow** - Led a research group that developed probing strategies for identifying objects in a computer image. Designed new algorithms for graph visualization. Improved optimization results for robot localization.

**Hoechst-Celanese Corporation** - Summit, NJ (9/94-8/95)
**University-Industry Research Fellow** - Consulted with chemical engineers and developed database applications in Microsoft Access for research in developing new plastics technologies.

**McGill University School of Computer Science** - Montreal, Quebec (9/92-8/94)
**Postdoctoral Fellow** - Solved an optimization problem for robot localization. Developed graph visualization algorithms. Consulted with the Center for Night Vision and Electro-Optics on applications of geometric probing to computer vision. Developed curriculums and taught several undergraduate computer science courses.

**University of Maryland Computer Science Department** - College Park, MD (8/87-8/92)
**Graduate Assistant** - Developed geometric probing strategies for maximizing the effectiveness of automatic target recognition and automated manufacturing applications. Designed software complexity measures to assess the difficulty of testing. Assisted in teaching several computer science courses.

**Texas Instruments, Inc. (Design Automation Division)** - Dallas, TX (7/85-7/87)
**Software Design Engineer** - Designed and developed VLSI CAD tools for chip designers. Implemented algorithms for synthesis and compaction of chip layouts that improved the quality of the layouts and decreased design cycle time. Solved standard cell routing problems.

## LANGUAGES / OPERATING SYSTEMS / PROJECTS:

**Languages** - C, Fortran, Pascal, Lisp, Prolog, Access Basic, Visual Basic, DCL, Assembly, others.

**Operating Systems** - Unix, MS DOS, VMS, HP 1000, Apollo Aegis, others.

**Projects** - Optical processor simulator (Fortran), VLSI layout and compaction tools (Pascal), Compiler for Ada subset (Pascal), Multiprocess operating system for IBM PC (C & Assembly), Chemical database applications (Microsoft Access Basic), AI frame-based deduction system (Lisp), Discrete event simulator (Pascal).

**EDUCATION:**

**University of Maryland**, College Park, MD - PhD Computer Science
Advisor: Carl Smith. Dissertation: "Approximate Testing Theory"

**University of Maryland**, College Park, MD - M.S. Computer Science. GPA 4.0/4.0.

**Carnegie-Mellon University**, Pittsburgh, PA - B.S. (University Honors)
Applied Mathematics, Computer Science and Spanish. GPA 3.5/4.0.

**SELECTED PUBLICATIONS:**

**"Localizing a Robot with Minimum Travel"** (with Gregory Dudek and Sue Whitesides) - SIAM Journal on Computing - to appear.

**"Localizing an Object with Finger Probes"** (with R. Freimer, S. Khuller, J.S.B. Mitchell, C. Piatko, D. Souvaine) - Vision Geometry III, part of SPIE's International Symposium on Photonics for Industrial Applications; Boston, MA October 31 - November 4, 1994.

**"Using Computational Learning Theory to Analyze the Testing Complexity of Program Segments"** (with Jeffrey S. Vitter) - The IEEE Computer Society's $17^{th}$ International Computer Software and Applications Conference, November 1993.

**"On a Visibility Representation for Graphs in Three Dimensions"** (with P. Bose, H. Everett, S. Fekete, A. Lubiw, H. Meijer, T. Shermer, S. Whitesides) - Journal on Graph Algorithms and Applications.

**PROFESSIONAL ACTIVITIES:**

Invited participant at workshops

- Workshop on Geometric and Computational Aspects of Injection Molding – Bellairs Research Institute of McGill University; February 1993.
- Geometric Probing in Computer Vision Workshops 1-7 – University of Maryland and Cornell University; Sponsored by the Center for Night Vision & Electro-Optics.

Referee for professional journals

- Journal of the Association for Computing Machinery
- International Journal on Computational Geometry and Applications
- Journal of Software Testing, Verification and Reliability
- Machine Learning

VI Congreso Español de Geometria Computacional, Barcelona, Spain, July 5-7, 1995
invited speaker, "Geometric Probing and Testing"
Sixth Canadian Conference on Computational Geometry, August 1994 – program committee
Geometry Seminar, School of Computer Science, McGill University, 1993-94 – coordinator
Search Committee for Dean of the College of Computer, Mathematical, and Physical Sciences, University of Maryland, 1990 – member
Computer Science Graduate Student Executive Council, University of Maryland, 1987-89