

Osman Burchan Bayazit

Media & Machines Lab
Department of Computer Science and Engineering
Washington University in St. Louis
One Brookings Drive, Campus Box 1045
St. Louis, MO 63130-4899

Assistant Professor
phone: (314) 935-5876
fax: (314) 935-7302
email: bayazit@cse.wustl.edu
<http://www.cse.wustl.edu/~bayazit>

Education

Ph.D. in Computer Science, Texas A&M University, May 2003

Dissertation: *Solving Motion Planning Problems by Iterative Relaxation of Constraints*

Thesis advisor: Nancy M. Amato

M.S. in Computer Science, Texas A&M University, May 1998

Thesis: *Choosing Good Distance Metrics and Local Planners for Probabilistic Roadmap Methods*

Thesis advisor: Nancy M. Amato

B.S. in Computer Engineering, Middle East Technical University, June 1994

Research Interests

Motion planning, robotics, CAD, VR, computational biology/chemistry,
haptic interfaces, machine learning, group behaviors

Honors and Awards

Student Design Contest Third Place, 42nd DAC/ISSCC Design Contest, 2005

Student Research Week, First Place in Engineering (University wide annual award recognizing research excellence), Texas A&M University, 2002

Graduate Student Research Award (Annual award recognizing research excellence), Second Place, Department of Computer Science, Texas A&M University, 2001

Fellowship for Graduate Studies Abroad, Turkish Ministry of Education, 1996

Professional Activities

Service on Program Committees

IEEE/RSJ International Conference on Intelligent Robots and Systems, 2005

International Conference on Autonomous and Autonomic Systems, 2005

International Workshop on Robot Motion and Control Program, 2005

International Conference on Intelligent Autonomous Systems, 2004

Swarm Robotics: SAB 2004 International Workshop

Reviewer (in addition to above conferences)

IEEE Transactions on Robotics

IEEE Transactions on Automation Science and Engineering

The Proceedings of the IEEE on "Multi-Robot Systems"
Systems, Man and Cybernetics Journal
The Mid-West Graphics Conference, Mid-Graph 2004

Invited Participations and Talks

Digital Design Symposium, Istanbul, 2005
Bogazici University, Istanbul, 2005
Sabanci University, Istanbul, 2005
Swarm Robotics: SAB 2004 International Workshop
Center for Security Technologies Research Review, Washington University, 2004

Service for the Department and University

CSE Technology Acquisition Committee, Chair
CEC Advisory Board
Faculty Advisor for ACM International Collegiate Programming Contest Team

Community Outreach Activities

Mentor, STARS (Students and Teachers as Research Scientists), 2004, 2005
Judge, FIRST Robotics, 2004
On-site Judge, ACM International Collegiate Programming Contest, 2004

Professional Experience

Assistant Professor, Department of Computer Science & Engineering, Washington University in St. Louis (Summer 2005 – Present)

Visiting Assistant Professor, Department of Computer Science & Engineering, Washington University in St. Louis (Fall 2003 – Summer 2005)

Post-Doctoral Research Associate, Parasol Lab, Texas A&M University (Summer 2003)

- Developed motion planning algorithms for shepherding behaviors.
- Mentored CRA-DMP and Texas A&M Research Experience for Undergraduates students.

Research Assistant, Department of Computer Science, Texas A&M University (1997 – 2003)

- Instructed CPSC 311 Analysis of the Algorithms in Fall 2002.
- Worked on Randomized Probabilistic Roadmap (PRM) algorithms for motion planning (MP).
- Applied randomized motion planners to molecular docking.
- Designed and implemented randomized motion planners for deformable objects.
- Developed rule-based roadmaps for dynamic group behaviors.
- Researched cooperative man-machine motion planning utilizing haptic input devices (PHANTOM 3 dof and 6 dof).
- Implemented visualization tools for motion planners (used VTK, Tcl/Tk, OpenGL, GLUT, MFC, Xt, Motif and Entropic speech recognition library).

System Administrator, Department of Computer Science, Texas A&M University (1998 – 2003)

- Administrated IRIX, Linux and Windows NT systems.
- Installed and administrated network services including NIS, NFS, web and database servers.
- Developed internet and intranet applications with Perl, PHP and MySQL.

Teaching Assistant, Department of Computer Engineering, METU, (1994 – 1996)

- Research topic: neural networks.
- Lab instructor for microprocessors and several programming language classes

Software Engineer, Mona Yazilim, Istanbul, Turkey (Summer 1993)

- Developed database software for banking industry

Software Engineer, Halici Yazilim, Ankara, Turkey (Summer 1992)

- Developed Computer Aided Teaching software

Publications in Refereed Journals and Conferences

- [1] Gazihan Alankus, A. Alphan Bayazit, Burchan Bayazit, “Automated Motion Synthesis for Dancing Characters,” *Journal of Computer Animation and Virtual World*, To appear. (Journal version of [4])
- [2] Gazihan Alankus, Nuzhet Atay, Chenyang Lu, O. Burchan Bayazit, “Spatiotemporal Query Strategies for Navigation in Dynamic Sensor Network Environments,” *Proceedings of the 2005 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, To appear.
- [3] O. Burchan Bayazit, Dawen Xie, Nancy M. Amato, “Iterative Relaxation of Constraints: A Framework for Improving Automated Motion Planning,” *Proceedings of the 2005 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, To appear.
- [4] Gazihan Alankus, A. Alphan Bayazit, Burchan Bayazit “Automated Motion Synthesis for Dancing Characters,” *Proceedings of the 2005 International Conference on Computer Animation and Social Agents (CASA)*, To appear.
- [5] Nuzhet Atay, John Lockwood, Burchan Bayazit, “A Collision Detection Chip on Reconfigurable Hardware,” *Proceedings of the 2005 Pacific Conference on Computer Graphics and Applications (Pacific Graphics)*, To appear.
- [6] Jyh-Ming Lien, O. Burchan Bayazit, Ross T. Sowell, Samuel Rodrigues, Nancy M. Amato, “Shepherding Behaviors,” *Proceedings of the 2004 IEEE International Conference on Robotics and Automation (ICRA)*, April 2004, pp. 4159–4164.
- [7] O. Burchan Bayazit, Jyh-Ming Lien, and Nancy M. Amato, “Swarming Behavior Using Probabilistic Roadmap Techniques”, p. 112, *Lecture Notes in Computer Science, Springer-Verlag GmbH, Swarm Robotics*, eds. Erol Sahin, William M. Spears.
- [8] O. Burchan Bayazit, Guang Song, Nancy M. Amato, “Enhancing Randomized Motion Planners: Exploring with Haptic Hints,” in *Autonomous Robots Journal*, Special Issue on Personal Robotics, **10**(2), 2001, pp. 163–174. (Journal version of [15])
- [9] Nancy M. Amato, O. Burchan Bayazit, Lucia K. Dale, Christopher Jones, Daniel Vallejo, “Choosing Good Distance Metrics and Local Planners for Probabilistic Roadmap Methods,” *IEEE Transactions on Robotics and Automation*, **16**(4), August 2000, pp. 442–447. (Journal version of [16])
- [10] O. Burchan Bayazit, Jyh-Ming Lien, Nancy M. Amato, “Better Group Behaviors in Complex Environments using Global Roadmaps” *Proceedings of the 2002 Artificial Life (ALIFE): The 8th International Conference on the Simulation and Synthesis of Living Systems*, December 2002.

- [11] O. Burchan Bayazit, Jyh-Ming Lien, Nancy M. Amato, “Better Flocking Behaviors using Rule-Based Roadmaps,” *Proceedings of the Workshop on Algorithmic Foundations of Robotics (WAFR)*.
- [12] O. Burchan Bayazit, Jyh-Ming Lien, Nancy M. Amato, “Roadmap-Based Flocking for Complex Environments,” *Proceedings of the 2002 Pacific Graphics*, October 2002, pp. 104–113.
- [13] O. Burchan Bayazit, Jyh-Ming Lien, Nancy M. Amato, “Probabilistic Roadmap Motion Planning for Deformable Objects,” *Proceedings of the 2002 IEEE International Conference on Robotics and Automation (ICRA)*, May 2002, pp. 2126–2133.
- [14] O. Burchan Bayazit, Guang Song, and Nancy M. Amato, “Ligand Binding with OBPRM and User Input,” *Proceedings of the 2001 IEEE International Conference on Robotics and Automation (ICRA)*, May 2001, pp. 954–959.
- [15] O. Burchan Bayazit, Guang Song, Nancy M. Amato, “Enhancing Randomized Motion Planners: Exploring with Haptic Hints,” *Proceedings of the 2000 IEEE International Conference on Robotics and Automation (ICRA)*, April 2000, pp. 529–536.
- [16] Nancy M. Amato, O. Burchan Bayazit, Lucia K. Dale, Christopher Jones, Daniel Vallejo, “Choosing Good Distance Metrics and Local Planners for Probabilistic Roadmap Methods,” *Proceedings of the 1998 IEEE International Conference on Robotics and Automation (ICRA)*, May 1998, pp. 630–637.
- [17] Nancy M. Amato, O. Burchan Bayazit, Lucia K. Dale, Christopher Jones, Daniel Vallejo, “OBPRM: An Obstacle-Based PRM for 3D Workspaces,” *Proceedings of the Workshop on Algorithmic Foundations of Robotics (WAFR)*, March 1998, pp. 155–168.

Other Publications and Posters

- [18] O. Burchan Bayazit, Jyh-Ming Lien, and Nancy M. Amato, “Swarming Behavior Using Probabilistic Roadmap Techniques,” *Workshop on Swarm Robotics, Simulation of Adaptive Behavior, SAB’04*.
- [19] Gazihan Alankus, A. Alphan Bayazit, Burchan Bayazit, “Automated Motion Synthesis for Virtual Choreography,” *Mid-Graph 2004*.
- [20] Nuzhet Atay, John Lockwood, Burchan Bayazit, “Collision Detection System using an FPGA Implemented on the FPX Platform”, Poster presented at IEEE International Solid-State Circuits Conference (ISSCC), 2005, and Design Automation Conference (DAC), 2005.
- [21] “Solving Motion Planning Problems by Iterative Relaxation of Constraints,” *Ph.D. Dissertation, Department of Computer Science, Texas A&M Univ.*, 2003.
- [22] O. Burchan Bayazit, “Choosing Good Distance Metrics and Local Planners for Probabilistic Roadmap Methods,” *M.S. Thesis, Department of Computer Science, Texas A&M Univ.*, 1998.
- [23] O. Burchan Bayazit, Guang Song, Nancy M. Amato, “Ligand Binding with OBPRM and Haptic User Input: Enhancing Automatic Motion Planning with Virtual Touch,” *Currents in Computational Molecular Biology*, ed. El-Mabrouk, Lengauer, Sankoff, Les Publications CRM, Montreal, Canada, April 2001. Also poster presented at *Research on Comp. Mol. Biology (RECOMB) 2001*.

- [24] O. Burchan Bayazit, “Force Feedback Applications in Motion Planning,” Presentation at *Symposium on Computer Graphics & Digital Art, TEXGRAPH’00*, Texas A&M University, May 2000.
- [25] Nancy M. Amato, O. Burchan Bayazit, Guang Song, “Providing Haptic ‘Hints’ to Automatic Motion Planners,” *Proceedings of the 4th PHANTOM User’s Group Workshop (PUG’99)*, Dedham, MA, October 1999.
- [26] Nancy M. Amato, O. Burchan Bayazit, Kyunghwan Kim, Wookho Son, Guang Song, “Co-operative Motion Planning: Providing Hints to Automatic Motion Planners,” Presentation at *Workshop on Motion Support in Virtual Prototyping*, Stanford University, May 1999
- [27] O. Burchan Bayazit, Levent Erkok, Okan Uludag, Fatos Yarman Vural, “Gray Level Texture Generation by Binary Markov Random Field Model with Morphological Operations,” Technical Report 95-10, Department of Computer Engineering, Middle East Technical University, July 1995.

Current Students

Mr. Gazihan Alankus, D.Sc.
 Mr. Nuzhet Atay, D.Sc.
 Mr. Qian Wan, D.Sc.
 Mr. Brian Haynes, M.S.
 Mr. Stuart Glaser, B.S.

Student Committees Served

Mr. Timothy Gatzke, D.Sc., Adv: Dr. Grimm
 Mr. Eduard Kotysh, Adv: Dr. Crowley
 Mr. Aaron Beckerman, Adv: Dr. Smart
 Mr. Ariel Weinstein, Adv: Dr. Smart

Undergraduate Research Projects Supervised

Mr. T. Sowell, Sophomore CS major, The University of South, Research Internship at Texas A&M, Summer 2003. Currently a graduate student at Washington University in St. Louis.
 Mr. Ross T. Sowell, Sophomore CS major, The University of South, Research Internship at Texas A&M, Summer 2003. Currently a graduate student at Washington University in St. Louis.
 Mr. Omer Onur Dogan, Junior EE major, Bogazici Univ., Turkey. Research Internship at Texas A&M Univ., Summer 2001. Currently a graduate student at UPenn.
 Mr. Rick Stover, Freshman CE major, 11/00–05/01.
 Ms. Shawna Miller, Sophomore CE major, 10/99–05/00. Currently a graduate student at Texas A&M Univ.
 Mr. Chris Jones, Junior CE major, 08/97–05/98. Currently a Ph.D. student at USC.

Highschool Research Projects Supervised

Mr. Andrew Heckman, Summer 2005, On-going Research.

Mr. Brian Mengwasser, Summer 2004, Won Solutia Awards for Excellence in Research

Mr. Kevin Knocke, Summer 2004, Won Solutia Awards for Excellence in Research

Courses Taught

WUSTL-CSE-558A: Introduction to Motion Planning (Graduate Course)

WUSTL-CSE-362M: Computer Architecture (Undergraduate Course)

WUSTL-CS-527A: Machine Learning (Graduate Course)

WUSTL-CS-522A: Introduction to Motion Planning (Graduate Course)

TAMU-CPSC-311: Analysis of Algorithms (Undergraduate Course)

METU-CENG-335: Microprocessor and Microcomputers (Undergraduate Course, Lab Instructor)

Languages

C/C++, Pascal, FORTRAN, Perl

User Interface, Graphics and Virtual Reality

OpenGL, GLUT, Tcl/Tk, VTK, Motif, Xt, Qt, Ghost Haptic Library,

Entropic graphVite/HTK Speech Recognition Library

Web and Database

PHP, Javascript, SQL

Operating Systems

VM, VMS, DOS, OS/2, Windows, MacOS, UNIX (IRIX, Solaris, OSF/1, HP-UX, Linux)

Activities

Member IEEE & ACM

Mentor for Texas A&M Research Experience for Undergraduate Summer Program, 2003

METU Computer Society, Vice President, 1992–1994

TAMU Turkish Student Association, Social Secretary, 1996–1998

Writer for Turkish Technology Site, TeknoTurk, 2000–2001

References

Available upon request.