

Marco Morales

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Education

PH.D. CANDIDATE IN COMPUTER SCIENCE. Texas A&M University

Expected Graduation: August 2007

Dissertation Proposal: "Feature-Sensitive Construction of Motion Planning Roadmaps"

Academic Advisor: Prof. Nancy M. Amato

M.S. IN ELECTRICAL ENGINEERING. Universidad Nacional Autónoma de México (UNAM), Nov. 1998

M.S. Thesis: "Control de un Robot Móvil usando Redes Neuronales y Sistemas Expertos" (Mobile Robot Control with Neural Networks and Expert Systems)

Academic advisor: Prof. Jesús Savage Carmona

B.S. IN COMPUTER ENGINEERING. UNAM, Aug. 1996

B.S. Thesis: "Diseño, Construcción y Control de Vehículo Manipulador de Navegación Autónoma para transferencia de piezas" (Design, Construction, and Control of a Manipulator Vehicle with Autonomous Navigation for Parts Transfer)

Academic advisor: Prof. Ignacio Juárez Campos

Research Interests

Motion planning, computational geometry, robotics, artificial intelligence, machine learning, optimization, computational neuroscience, computational biology, architectures, and parallel computing.

Honors and Awards

FULBRIGHT-GARCIA ROBLES SCHOLARSHIP to pursue Ph.D. at TAMU Department of State, USA, CONACYT, México Aug. 2000 – Aug. 2004

CONACYT SCHOLARSHIP to pursue Master's at UNAM CONACYT Sep. 1995 – Jun. 1997

SUPERCOMPUTING PROGRAM SCHOLARSHIP for training in supercomputing systems Cray Research, UNAM Sep. 1994 – Mar. 1995

IEEE TRAVEL GRANT to attend conference at Taipei, Taiwan International Conf. in Robotics and Automation Sep. 2003

GTA FELLOW AND CERTIFICATE OF COMPLETION for the professional development in college teaching Texas A&M Graduate Teaching Academy Sep. 2004 – May. 2005

Professional Experience

RESEARCH ASSISTANT for Prof. Nancy Amato Dept. of Computer Science, Texas A&M University College Station, Texas, USA Sep. 2000 – Present

RESEARCH ASSISTANT for Prof. Jesús Savage México, D.F., México Dept. of Computer Engineering, UNAM Oct. 1996 – Jul. 2000

LECTURER PROFESSOR México, D.F., México Dept. of Computer Engineering, UNAM Jan. 1997 – Jul. 2000

Courses taught: Computers and Programming; Expert Systems.

INDEPENDENT CONSULTANT Intracom Consultores
México, D.F., México Aug. 1999 – Jul. 2000
Design, writing, and testing of software including an Internet-based electronic store, a system for clients of a Mexican broker of the stock market, and a data analysis application for the construction industry.

INDEPENDENT CONSULTANT Intercom and Focus Consultores
México, D.F., México Aug. 1998 – May. 1999
Migration of risk analysis functions used to take decisions in the stock market to make them scalable.

INDEPENDENT CONSULTANT Intercom
México, D.F., México Jan. 1998 – Jul. 1999
Analysis of components of imaging and document management systems for hospitals.

RESEARCHER PROFESSOR AND LECTURER Div. of Informatics, UTFV (junior college)
PROFESSOR
Nicolás Romero, México, México Jan. – Apr. 1996, Aug. 1997 – Dec. 1998
Courses taught: Logic for Programming, Advanced Programming, and Analysis and Design of Information Systems.

SYSTEM ADMINISTRATION STAFF Dept. of Supercomputing, DGSCA, UNAM
México, D.F., México Mar. 1995 – Feb. 1996
Member of the team in charge of user administration of the Cray-YMP/464 supercomputer of UNAM.

SOCIAL SERVICE STAFF Advanced Computing Lab, College of Eng., UNAM
México, D.F., México Dec. 1993 – Jun. 1994
Technical support and maintenance of software used in structure simulations.

Publications in Refereed Journals and Conferences

[1] MARCO A. MORALES A., Roger Pearce, Nancy M. Amato, "Analysis of the Evolution of C-Space Models Built through Incremental Exploration", in *Proceedings of the IEEE Conference on Robotics and Automation (ICRA) 2007*, To appear, Roma, Italy, Apr. 2007. Acceptance rate = 44% (787/1800).

[2] Shawna Thomas, MARCO A. MORALES A., Xinyu Tang, Nancy M. Amato, "Biasing Samplers to Improve Performance", in *Proceedings of the IEEE Conference on Robotics and Automation (ICRA) 2007*, To appear, Roma, Italy, Apr. 2007. Acceptance rate = 44% (787/1800).

[3] Dawen Xie, MARCO A. MORALES A., Roger Pearce, Shawna Thomas, Jyh-Ming Lien, Nancy M. Amato, "Incremental Map Generation (IMG)", in *Proceedings of the International Workshop on the Algorithmic Foundations of Robotics (WAFR) 2006*, to appear, New York, New York, U.S.A., Jul. 2006. Acceptance rate = 49% (32/65).

[4] MARCO A. MORALES A., Roger Pearce, Nancy M. Amato, "Metrics for Analyzing the Evolution of C-Space Models", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA) 2006*, pp. 1268-1273, Orlando, Florida, U.S.A., May 2006. Acceptance rate = 39% (680/1756).

[5] MARCO A. MORALES A., Lydia Tapia, Roger Pearce, Samuel Rodriguez, Nancy M. Amato, "C-Space Subdivision and Integration in Feature-Sensitive Motion Planning", in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA) 2005*, pp. 3114-3119, Barcelona, Spain, May 2005. Acceptance rate = 44% (750/1700).

[6] MARCO MORALES, Lydia Tapia, Roger Pearce, Samuel Rodriguez, Nancy M. Amato, "A Machine Learning Approach for Feature-Sensitive Motion Planning", in *Proceedings of the International Workshop on the Algorithmic Foundations of Robotics (WAFR) 2004*, pp. 361-376, Utrecht/Zeist, The Netherlands, Jul. 2004.

[7] MARCO MORALES, Samuel Rodríguez, Nancy M. Amato, “Improving the Connectivity of PRM Roadmaps”, in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA) 2003*, pp. 4427-4432, Taipei, Taiwan, Sep. 2003. Acceptance rate = 60% (711/1176).

[8] Jyh-Ming Lien, MARCO MORALES, Nancy M. Amato, “Neuron PRM: A Framework for Constructing Cortical Networks”, *Neurocomputing*, 52-54(28):191-197, Jun. 2003. (Poster presented at the Annual Computational Neuroscience Meeting (CNS), Jul. 2002).

[9] Jesús Savage, MARCO MORALES, Roman Osorio, Andrés Pérez, Jimena Olveres, “Learning Mobile Robot Paths Using Potential Field Methods”, *Proceedings of the IFAC/IFIP/IEEE Conference on Management and Control of Production and Logistics 2000 (MCPL '00)*, Jul. 2000.

[10] MARCO ANTONIO MORALES AGUIRRE, Jesús Savage, “Mobile Robot Control using Expert Systems and Neural Networks”, *International Symposium on Robotics and Automation '98*, Saltillo, Coahuila, México, Dec. 1998.

Unrefereed Publications, Technical Reports and Posters

[11] Aimée Vargas, Jyh-Ming Lien, MARCO A. MORALES A., Samuel Rodriguez, Nancy M. Amato, “User-Guided Path Planning”, *Technical Report, TR05-011, Parasol Laboratory, Department of Computer Science, Texas A&M University*, Sep 2005.

[12] Jesús Savage, MARCO A. MORALES A., Edna Márquez, Fernando Lepe-Casillas, “The Use of Hidden Markov Models and Vector Quantization for Mobile Robot Localization”. *Robotics and Applications (RA) 2005*, IASTED, Boston, U.S.A. 2005.

[13] MARCO ANTONIO MORALES AGUIRRE “Control de Robot Móvil Usando Redes Neuronales y Sistemas Expertos”, Facultad de Ingeniería, Universidad Nacional Autónoma de México (UNAM), Nov. 1998 (M.S. Thesis).

[14] MARCO ANTONIO MORALES AGUIRRE “Diseño, Construcción y Control de un Vehículo Manipulador de Navegación Autónoma para Transferencia de Piezas”, Facultad de Ingeniería, Universidad Nacional Autónoma de México (UNAM), Aug. 1996 (B.S. Thesis).

Professional Service and Activities

REVIEWER

For journals: IEEE Transactions on Robotics and Automation (TRA), IEEE Transactions on Robotics (TRO), and International Journal of Robotics Research (IJRR).

For conferences: International Workshop on the Algorithmic Foundations of Robotics (WAFR), IEEE International Conference on Robotics and Automation (ICRA), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Robotics: Science and Systems conference (RSS), and IEEE International Parallel & Distributed Processing Symposium (IPDPS)

MEMBER OF PROFESSIONAL ASSOCIATIONS

Institute of Electrical and Electronics Engineers (IEEE), Association for Computing Machinery (ACM), Sociedad de Exalumnos de la Facultad de Ingeniería de la UNAM (Society of Former Students of the College of Engineering of UNAM: SEFI), and Asociación de Ingenieros Universitarios Mecánicos y Electricistas (Association of Mechanical and Electrical Engineers from Mexican Universities: AIUME)

Significant University Service and Community Outreach Activities

PRESIDENT, Texas A&M Fulbright Association College Station, Texas, USA, Jan. – Dec. 2005
Presided and organized all the activities of the Association in collaboration with vice-presidents, program coordinators, and members. Represented the Association in events and activities in Texas A&M University. Significant projects included:

- Coordinated with the Brazos Valley Chapter of the Fulbright Association to organize activities to enhance the experience of visitor Fulbrighters in Texas A&M including trips to the area surrounding College Station.
- Coordinated a mentor program for newly admitted Fulbrighters with support of the Sponsored Students Program office of Texas A&M.
- Coordinated a hospitality program for incoming Fulbrighters where members of the association helped in their arrival to find housing, roommates, and settle in College Station.
- Social and sports activities for Fulbrighters and their families.
- Collaborated with officials of Texas A&M in prioritizing key concerns of international students, these concerns were addressed through University policy changes.

HOSPITALITY PROGRAM COORDINATOR, College Station, Texas, USA, Jan. – Sep. 2004
 Texas A&M Fulbright Association
 Program for incoming Fulbrighters where members of the association helped in their arrival to find housing, roommates, and settle in College Station.

AI AND ROBOTICS SEMINAR COORDINATOR College Station, Texas, USA, Jan. 2001 - Feb. 2003
 Department of Computer Science, Texas A&M University

PARASOL SEMINAR COORDINATOR College Station, Texas, USA, Mar. 2003–Aug. 2005
 Parasol Laboratory, Texas A&M University May - Jul. 2006

QUESTION AUTHOR, EGEL INFO-COMP TEST, México, D.F., México, Jul. 1999
 CENEVAL (National Center for Evaluations)
 Contributions to the "general test for graduates of B.S. on Informatics and Computing"

ORGANIZATION TEAM, Mobile Robots Competition México, D.F., México, Jan. 1999
 UNIVERSUM, UNAM

JUDGE The Week of Engineering 1998 México, D.F., México, May 1998
 College of Engineering, UNAM

MEMBER OF UNAM TEAM Querétaro, Querétaro, México, May 1998
 Third National Minirobotics Competition

COACH OF UNAM TEAM Querétaro, Querétaro, México, Oct. 1997
 Regional ACM Programming Competition

Professional and Invited Presentations (in addition to regular conference talks)

"Metrics for Analyzing the Evolution of C-Space Models"
 Parasol Seminar, Texas A&M University, College Station, TX, USA, May 12, 2006

"Evaluating the Quality of Motion planning Roadmaps"
 Parasol Seminar, Texas A&M University, College Station, TX, USA, Dec. 2, 2005

"Improving the Connectivity of PRM Roadmaps"
 Parasol Seminar, Texas A&M University, College Station, TX, USA, Sep. 5, 2003

"Mobile Robot Design"
 Workshop on Robotics, College of Engineering, UNAM, México, D.F., México, May 1999
 Workshop on Robotics, College of Engineering, UNAM, México, D.F., México, May 1998

"Robotics"
5th National Week on Science and Technology, UTFV, Nicolás Romero, México, México, Oct. 1998

"Path planning for mobile robots"
Week of Engineering, College of Engineering, UNAM., México, D.F., México, May 1998
Microsoft Academic Day, México, D.F., México, Apr. 1998
Academic Week, Universidad del Valle de México, Tlalpan, D.F., México, Oct. 1997

"CLIPS-based visualization tool for robots simulations"
Colloquium "Research at the College of Engineering", UNAM, México, D.F., México, Feb. 1997

"The Internet"
Celebration week of the first anniversary of the UTFV, Nicolás Romero, México, México, Jan 1996

Student Research Mentoring

Supervised of three undergraduate students in the Department of Computer Engineering of UNAM in their development of their thesis to get the degree of Computer Engineer:

- Mr. José Salvador Rentería Ibarra. "Propuesta de metodología para la creación de ambientes virtuales" (Proposal for a methodology to build virtual environments), 2001
- Ms. Lizbeth Alejandra Mohzo Sánchez. "Propuesta de metodología para la creación de ambientes virtuales" (Proposal for a methodology to build virtual environments), 2001
- Mr. Saúl Cristobal Figueroa Cálix. "Control a distancia de un robot móvil utilizando principios de teleoperación" (Mobile robot control based on tele-operation), 2000

Student research mentoring:

- Ms. Terra Horton. Major in Computer Science and Mathematics and Minor in Accounting at Langston University (Langston, OK). Participant of the CRA-W Distributed Mentoring Project (DMP). Summer 2005
- Mr. Samuel Rodríguez, Ph.D. student in Computer Science at Texas A&M University, Summer - Fall 2003

Supervised the industry internship and final project of two students in the Division of Informatics of UTFV (Junior College) to get the associate degree on Informatics. Member of the Advisory Committee for other two students to evaluate their final project.

Languages

Spanish: native speaker; *English*: fluent; *Nahuatl*: beginner; *German*: beginner.

References

Available upon request.

January 6, 2007.