1. Education

Ph.D. in Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, USA, December 1996. Thesis: ά 5 è ў l· Y ƛ Ŏ ă l· ў Ř Ŏ ƨ ў ű NJ ƨ f ƨ Ŧ dz ў Ř Ŝ NJ l· Ŏ ű dz l· ű Ŝ Ř Y l· ў ƛ LJdz f l· ű ƨ NJ ă Φ έ

M.Sc. in 9 f Ŝ Ŏ ű NJ ƛ Ŏ l· f 9 ў Ǝ ƛ ў Ŝ Ŝ NJ ƛ ў Ǝ Σ ¦ ў ƛ Ø Ŝ NJ ă ƛ ű è ƨ Ŧ { ń ƨ t l· dz f ƨ Σ Ŏ ƨ ў ű NJ ƨ f ƨ Ŧ Y Ŝ Ŏ K l· ў ƛ Ŏ l· f Y l· ў ƛ LJdz f l· ű ƨ NJ ă Φ έ

. Φ { Ŏ Φ ƛ ў 9 f Ŝ Ŏ ű NJ ƛ Ŏ l· f 9 ў Ǝ ƛ ў Ŝ Ŝ NJ ƛ ў Ǝ Σ ¦ ў ƛ Ø Ŝ NJ ă ƛ ű è ƨ Ŧ { ń ƨ t l· d Ŏ ƨ ў ű NJ ƨ f ƨ Ŧ ă Ŝ NJ Ø ƨ Y Ŝ Ŏ K l· ў ƛ ă Y ă Φ έ

2. Research Interests

- Guidance, navigation, and control technologies for autonomous UAV systems, including robotic airships, fixed wing, and rotary-wing aircraft.
- Modeling and control methodologies for fault detection and recovery, fault-induced system control reconfiguration and replanning, and their applications to manipulators and robotic vehicles.
- Control architectures and algorithms for homogeneous and heterogeneous robot teams, including multiple manipulators, ground robots, and air-ground vehicles.
- Development and application of robotic, telepresence, and human-robot interaction technologies.
- Technology forecasting, planning and assessment. Integration of technology planning in system analysis, performance assessment, and design. Technology transfer.
- Technological innovation, innovation management, strategic planning.

3. Professional Experience

Since 06/2005: Robotics Institute, Carnegie Mellon University, Pittsburgh, PA, USA

Systems Scientist, since 09/2007

- Manager of the Autonomous Helicopter Laboratory.
- Project manager for Comprehensive Automation for Specialty Crops, funded by the USDA Specialty Crops Research Initiative. Total funding: $12 million. Period of performance: Sep. 2008 to Aug. 2012.

Project Scientist, Autonomous Helicopter Laboratory, 12/2005 to 08/2007

- Responsible for dynamic modeling and control methodologies for unmanned helicopters.
- Responsible for project management and interaction with government agencies.
- Co-responsible for procuring new funding sources and preparing proposals to funding agencies.
- Co-responsible for technical documentation, including conference and journal articles.

Project Scientist, Tele-Supervised Autonomous Robotics Laboratory, 06/2002 to 12/2005

- Co-responsible for system-level project leadership, focused on the definition of a general and widely applicable architecture for human supervision of a fleet of autonomous robots in support of sustained, affordable, and safe space exploration.
- Co-responsible for project management, including timely achievement of project schedules and completion of deliverables.
- Responsible for Earned Value Management reporting to the project sponsor, including all technical and financial reports.
- Co-responsible for procuring new funding sources and preparing proposals to funding and government agencies.
- Co-responsible for technical documentation, including conference and journal articles.

- Responsible for the creation and maintenance of a knowledge base for project data and documentation sharing, dissemination, and archival.
- Co-[illegible]

02/2001 to 06/2005: Genius Institute of Technology, Manaus, Brazil.

Innovation Manager, 04/2005-06/2005

Knowledge Management and Institutional Relations Program Leader, 01/2003-03/2005

Technology Management and Development Program Leader, 02/2002-12/2002

- Co-[illegible] strategic planning and budgeting.
- Co-responsible for technology analysis and forecast based on technical literature and market surveys. Technologies addressed target the multimedia, consumer electronics, and communication markets, specially audio and video compression, digital transmission systems, digital television, and speech recognition.
- Responsible for structuring and operating the funding, intellectual property, and information systems areas of the institute, including the coordination of all submissions to funding agencies.
- Responsible for the official accreditation of the institute at the Brazilian Ministry of Science and Technology and the Ministry of Development, Industry, and External Commerce.
- Co-responsible for the elaboration, submission, and successful approval by federal funding agencies of R&D grants totaling more than US$ 10 million.
- Co-[illegible] agencies and technology partners. Responsible for the elaboration, submission, and successful approval by the federal government of a priority program on Digital Television at the Amazon region.
- Responsible for the elaboration of technical and economical feasibility studies for external clients.
- [illegible] northern region, at the Federal University of Amazonas. Responsible for the establishment of R&D cooperation projects with leading Brazilian universities.
- Co-[illegible] Technology.
- Official presenter of the institute for clients and authorities visiting the site and for presentations made at client and government offices and external events.

02/2000 to 12/2000: Paulista University, Campinas, SP, Brazil

Lecturer, responsible for the courses Servomechanisms and Robotics and Control Systems and Automation.

02/1997 to 01/2001: National Technology Information Institute, Campinas, SP, Brazil

Laboratory Head, 2000-2001, Robotics and Computer Vision Laboratory

Associate Researcher, 1997-1999, Robotics and Computer Vision Laboratory

[illegible] (2001) [illegible]

- Principal investigator of projects Semi-Autonomous Robotic Vehicles, AURORA (Autonomous Unmanned Remote Monitoring Robotic Airship), and REAL (Remotely Accessible Laboratories), funded at US$ 570k by the Brazilian government.
- Co-responsible for the yearly strategic technology planning and budget planning for the Institute.
- Advisor of undergraduate and graduate students at the Universities of São Paulo and Campinas.

08/1992 to 12/1996: Space Robotics Laboratory, Carnegie Mellon University, Pittsburgh, PA, USA.

Research Assistant to Dr. Yangsheng Xu.

01/1991 to 07/1992: Department of Electrical Engineering, University of São Paulo, São Paulo, Brazil.

Lecturer, responsible for the courses Control Systems Laboratory, Automation Laboratory, and Industrial Processes Control.

4. Publications

Books in Preparation

Siqueira, A.A.G; Terra, M.H.; Bergerman, M. *Control of Robot Manipulators*. Springer-Verlag. Expected to be published in 2010.

Books Edited

Passos, C.A.S.; Silva Filho, O.S.; Bergerman, M. *Annals of the II Scientific Initiation Journey of the National Technology Information Institute*. ITI, Campinas, SP, Brazil, November, 2000. (in Portuguese)

Chapters in Books

[illegible] innovation world through [illegible] *The Future of the Amazon*, Alex Fiúza de Mello (ed.), Federal University of Pará Publishing Co., Belém, PA, Brazil, pp. 169-195, 2002.

Elfes, A.; Bueno, S.S.; Ramos, J.J.G.; Paiva, E.C.; Bergerman, M.; Carvalho, J.R.H.; Maeta, S.M.; Mirisola, L.G.B.; Faria, [illegible] *Lecture Notes in* [illegible] *Computer Science Vol. 2238: Sensor-Based Intelligent Robots*, Christensen, H.I. and Hager, G.D. (eds.), Springer-Verlag, New York, 2002, pp. 216-244. (Invited article at the Dagstuhl 2000 International Seminar on Modelling of Sensor-Based Intelligent Robot Systems, Schloss Dagstuhl, Germany.)

[illegible] *Sensor Fusion and Decentralized Control in Robotic Systems IV*, Gerard T McKee, Paul S. Schenker (eds.), Proceedings of SPIE Vol. 4571, pp. 65-74, October 2001.

[illegible] *Robot Control 2000 (Proceedings of the 6th International IFAC Symposium on Robot Control)*, Kopacek, P. (ed.), Pergamon, July 2001.

[illegible] *Robot Control 2000 (Proceedings of the 6th International IFAC Symposium on Robot Control)*, Kopacek, P. (ed.), Pergamon, July 2001.

[illegible] *Dynamische* [illegible] *Perzeption*, Baratoff, G. and Neumann, H. (eds.), AKA, Berlin, September 2000.

[illegible] state-of-the-art review and [illegible] *International Symposium on History of Machines and Mechanisms - Proceedings HMM 2000*, Marco Ceccarelli (ed.), Kluwer Academic Publishers, Dordrecht, April 2000, pp. 361-369.

Refereed Journal Articles

Singh, S.; Baugher, T.; Bergerman, M.; Grocholsky, B.; Harper, J.; Hoheisel, G.; Hull, L.; Jones, V.; Kantor, G.; Koselka, H.; Lewis, K.; Messner, W.; Ngugi, H.; Owen, J.; Park, J.; Seavert, C. "Automation for specialty crops: a comprehensive strategy, current results, and future goals." *HortScience*, vol. 44, no. 4, July 2009, pp. 1109-1110. (Abstract)

[illegible] *Control Engineering Practice*, vol. 15, n. 5, May 2007, pp. 615-625.

[illegible] manipulators via actuation [illegible] *Journal of Robotic Systems*, vol. 20, n. 11, November 2003, pp. 635-648.

[illegible] planetary bodies [illegible] *Autonomous Robots*, vol. 14, n. 2-3, March-May 2003, pp. 147-164.

[illegible] Internet-accessible mobile robot labora[illegible] *Proceedings* [illegible] Special Issue on Networked Intelligent Robots Through the Internet, vol. 91, n. 3, March 2003, pp. 4-448. (Invited article)

Ramos, J.J.G.; Maeta, S.M.; Mirisola, L.G.B; Bueno, S.S.; Bergerman, M.; Faria, B.G.; Pinto, G.E.; Bruciapaglia, A.H. [illegible] *Proceedings* [illegible] Special Issue on Networked Intelligent Robots Through the Internet, vol. 91, n. 3, March 2003, pp. 4-463 (Invited article)

[illegible] *Transactions on Education*, vol. 46, n. 1, February 2003, pp. 9-47.

Azinheira, J.R.; E.C. Paiva; J.R.H. Carvalho; J.J.G. Ramos; S.S. Bueno; M. Bergerman; Ferreira, P.A.V. [illegible] *Aircraft Engineering and Aerospace Technology*, vol. 73, n. 5, 2001, pp. 450-458.

[illegible] *Control and Automation*, vol. 12, n. 2, May-August 2001, pp. 79-92.

Bergerman, M.; Kim, J. [illegible] *Robotics and Autonomous Systems*, vol. 32, n. 4, September 2000, pp. 253-257.

Bueno, S.S.; Ramos, J.J.G; Bergerman, M.; Paiva, E.C; Azinheira, J.R; Maeta, S.M.; Mirisola, L.G.B; Elfes, Faria, B.G. [illegible] *Robotica*, n. 39, April 2000, pp. 10-20. [illegible]

Liu, Y.-[illegible] *Transactions on Robotics and Automation*, vol. 15, n. 2, April 1999, pp. 258-267.

[illegible] *Brazilian Journal on Informatics and Education*, n. 3, September 1998, pp. 1-26. (Invited article)

[illegible] *Journal of the Brazilian Computer Society*, vol. 4, [illegible] April 1998, pp. 70-78.

Liang, B.; Xu, [illegible] *Transactions of the* ASME, *Journal of Dynamic Systems, Measurement, and Control*, vol. 120, n. 1, March 1998, pp. 1-7.

[illegible] *Journal of Robotic Systems*, vol. 15, n. 3, March 1998, pp. 115-130.

[illegible] *Transactions of the* ASME, *Journal of Dynamic Systems, Measurement, and Control*, vol. 118, n. 3, September 1996, pp. 557-565.

[illegible] *Journal of Robotic Systems*, vol. 12, n. 10, October 1995, pp. 693-707.

Refereed Conference/Workshop Papers

Singh, S.; Baugher, T.; Bergerman, M.; Grocholsky, B.; Harper, J.; Hoheisel, G.-A.; Hull, L.; Jones, V.; Kantor, G.; [illegible] Comprehensive [illegible] 4th IFAC International Workshop on Bio-Robotics, *Information Technology, and Intelligent Control for Bioproduction Systems*, Champaign, IL, September 2009, paper #501.

Singh, S.; Baugher, T.; Bergerman, M.; Grocholsky, B.; Harper, J.; Hoheisel, G.-A.; Hull, L.; Jones, V.; Kantor, G.; [illegible] Comprehensive Strategy [illegible] *2009 ASHS Annual Conference*, Poster Board #226

Podnar, G.; Dolan, J.; Elfes, A.; Bergerman, M.; [illegible] Vistas and Challenges in Telerobotics, *IEEE International Conference on Robotics and Automation*, May 2008.

[illegible] *International Conference on Intelligent Robots and Systems*, October-November 2007, pp. 135-140.

[illegible] *Conference and Exposition*, Long Beach, California, September 2007, Paper AIAA-2007-6165.

Elfes, A.; [illegible] *Spring Symposium 2006*, Stanford, CA, USA, March 27-29, 2006, pp 104-113.

Halberstam, E.; Navarro-Serment, L.; Conescu, R.; Mau, S.; Podnar, G.; Guisewite, A.D.; Brown, H.B.; Elfes, A.; [illegible] *Biennial International Conference on Engineering, Construction, and Operations in Challenging Environments*, Houston, TX, USA, March 5-8, 2006.

[illegible] *Annual Conference on Human-Robot Interaction*, Salt Lake City, UT, USA, March 2-4, 2006, pp. 325-326.

[illegible] *National Conference on Science, Technology, and Innovation*, Brasília, DF, Brazil, March 2004, pp. 1333-1342. (Invited article)

[illegible] IMAPS *International Technical Symposium on Packaging, Assembling and Testing & Exhibition*, Campinas, SP, Brazil, August 2003, pp. 144-149.

[illegible] A highly scalable hardware parallel architecture for motion [illegible] *Brazilian Symposium on Integrated Circuits and Systems Design*, São Paulo, SP, 2003.

Bergerman, M.; Blay, E.; Carvalho, J.R.H.; Gonçalves, C.; Ritz, R.; Lima, E.E.; Bruno, L.F.C.; Kang, T.C.; Cunha, A.L. [illegible] *International Conference of the Technology Research Institutes*, Porto Alegre, RS, Brazil, September 2002, pp 3-4.

Bergerman, M.; Blay, E.; Carvalho, J.R.H.; Gonçalves, C.; Ritz, R.; Lima, E.E.; Bruno, L.F.C.; Kang, T.C.; Cunha, A.L. [illegible] *Annual Conference of the Brazilian Association of the Technology Research Institutes*, Curitiba, PR, Brazil, May 2002.

[illegible] *International Conference on Robotics and Automation*, Washington D.C., USA, May 2002.

[illegible] *Brazilian Conference on Mechanical Engineering*, Uberlândia, MG, Brazil, November 2001.

Peixoto, R.P.; Maeta, S.M.; Yamaguchi, H.; Saura, C.; Silva, J.V.L.; Faria, B.G.; Fujiwara, C.T.; Frazzato, R.R.; Ramos, [illegible] -based development of mechanical parts for [illegible] *Brazilian Conference on Mechanical Engineering*, Uberlândia, MG, Brazil, November 2001.

[illegible] *International Conference on Advanced Robotics*, Budapest, Hungary, August 2001.

Carvalho, J.R.H.; Ferreira, P.A.V.; de Paiva, E.C.; Azinheira, J.R.; Ramos, J.G.; Bueno, S.S; Maeta, S.M.; Mirisola, [illegible] and robust PD control for an unmanned robotic [illegible] *International Symposium on Intelligent Robotic Systems*, Toulouse, France, July 2001.

[illegible] *Conference on Telematics Applications in Automation and Robotics*, Weingarten, Germany, July 2001, pp. 209-214.

[illegible] namic model for AURORA [illegible] th AIAA Lighter-Than-Air Technical Committee Convention and Exhibition*, Akron, OH, USA, July 2001.

Ramos, J.G.; de Paiva, E.C.; Carvalho, J.R.H.; Ferreira, P.A.V.; Azinheira, J.R.; Bueno, S.S; Maeta, S.M.; Mirisola, [illegible] 3rd *International Conference on Field and Service Robotics*, Otaniemi, Espoo, Finland, June 2001.

Maciel, B.C.O.; Bergerman, M.; Terra, M. [illegible] *International Conference on Robotics and Automation*, Seoul, South Korea, May 2001, pp. 2114-2119.

Ramos, J.J.G.; Paiva, E.C.; Azinheira, J.R.; Bueno, S.S.; Maeta, S.M.; Mirisola, L.G.B.; Bergerman, M.; Faria, B.G. [illegible] *International Conference on Robotics and Automation*, Seoul, South Korea, May 2001, pp. 4152-4157.

Guimarães, E.G.; Maffeis, A.T.; Pereira, J.L.P.; Russo, B.G.; Bergerman, M.; Cardozo, E.; Magalhães, M. Miglinski, [illegible] *Brazilian Symposium on Computer Networks*, Florianópolis, SC, Brazil, May 2001.

S.S. Bueno; M. Bergerman; J.J.G. Ramos; E.C. Paiva; J.R.H. Carvalho; A. Elfes; S.M. Maeta; L.G.B. Mirisola; B.G. Faria; [illegible] *Brazilian Science Society Meeting*, Manaus, AM, Brazil, April 2001.

[illegible] *Scientific Initiation Conference of the State University of Campinas*, Campinas, SP, Brazil, September 2000, pp. 44.

Pere[illegible] *Scientific Initiation Conference of the State University of Campinas*, Campinas, SP, Brazil, September 2000, pp. 144.

Maeta, S.M.; Ramos, J.J.G.; Mi[illegible] *Brazilian Conference on Automation*, Florianópolis, SC, Brazil, September 2000, pp. 922-927.

[illegible] communication system for an [illegible] *Brazilian Conference on Automation*, Florianópolis, SC, Brazil, September 2000, pp. 943-948.

[illegible] -based fault detection and isolation for [illegible] *Brazilian Conference on Automation*, Florianópolis, SC, Brazil, September 2000, pp. 1091-1096.

[illegible] *Brazilian Conference on Automation*, Florianópolis, SC, Brazil, September 2000, pp. 1353-1358.

[illegible] *Brazilian Conference on Automation*, Florianópolis, SC, Brazil, September 2000, pp. 925-930.

[illegible] -based H2 and H∞ [illegible] *Brazilian Conference on Automation*, Florianópolis, SC, Brazil, September 2000, pp. 1101-1107.

Ramos, J.J.G.; Paiva, E.C.; Maeta, S.M.; Mirisola, L.G.B.; Azinheira, J.R.; Faria, B.G.; Bueno, S.S.; Bergerman, M.; [illegible] Status [illegible] *International Airship Convention and Exhibition*, Friedrichshafen, Germany, July 2000, Article B7.

[illegible] environmental research and monitoring [illegible] *Scientific Conference*, Belém do Pará, PA, Brazil, June 2000, pp. 272.

[illegible] -swinging joint [illegible] *Symposium on Fault Detection, Supervision, and Safety for Technical Processes* SAFEPROCESS 2000, Budapest, Hungary, June 2000, pp. 840-845.

[illegible] feedback linearization via [illegible] *Symposium on Robust Control Design*, Prague, Czech Republic, June 2000.

[illegible] *Brazilian Symposium on Computer Networks*, Belo Horizonte, MG, Brazil, May 2000, pp. 505-518.

[illegible] *International Conference on Robotics and Automation*, San Francisco, CA, USA, April 2000.

Terra, [illegible] *Conference on Decision and Control*, Phoenix, AZ, USA, December 1999, pp. 3416-3421.

Ramos, J.J.G.; Maeta, S.M.; Bergerman, M.; Bueno, S.S. [illegible] *International Conference on Intelligent Robots and Systems*, Kyongju, South Korea, October 1999, pp. 1354-1359.

Ramos, J.J.G.; Maeta, S.M. [illegible] *International Conference on Advanced Intelligent Mechatronics*, Atlanta, GA, USA, September 1999, pp. 1008-1013.

[illegible] *National Conference on Applied and Computational Mathematics*, Santos, SP, Brazil, September 1999, pp. 229.

[illegible] *Brazilian Symposium on Intelligent Automation*, São Paulo, SP, Brazil, September 1999, pp. 301-305.

[illegible] -failure control and reconfiguration for robotic [illegible] *Brazilian Symposium on Intelligent Automation*, São Paulo, SP, Brazil, September 1999, pp. 107-112.

[illegible] ground robotic ensembles for cooperative [illegible] *International Conference on Field and Service Robotics*, Pittsburgh, PA, USA, August 1999, pp. 70-75.

[illegible] enviro[illegible] *International Conference on CAD/CAM, Robotics, and Factories of the Future*, Águas de Lindóia, SP, Brazil, August 1999, pp. RW12 to RW18.

[illegible] *International Conference on CAD/CAM, Robotics, and Factories of the Future*, Águas de Lindóia, SP, Brazil, August 1999, pp. RW13 to RW17.

[illegible] -based ground [illegible] *International Conference on CAD/CAM, Robotics, and Factories of the Future*, Águas de Lindóia, SP, Brazil, August 1999, pp. RT1 to RT12.

[illegible] *International Conference on CAD/CAM, Robotics, and Factories of the Future*, Águas de Lindóia, SP, Brazil, August 1999, pp. CT2-20 to CT2-25.

[illegible] [illegible] 318.

[illegible] autonomous [illegible] AIAA Lighter-Than-Air Systems Technology Conference, Norfolk, VA, USA, June 1999, pp. 141-148.

De Paiva, E.C.; Bueno, S.S. [illegible] *International Conference on Robotics and Automation*, Detroit, MI, USA, May 1999, pp. 2328-2335.

Tavares Filho, R.F.; Bergerman, M. [illegible] *International Symposium on Robotics and Automation*, Monterey, Mexico, Dec. 1998, pp. 1-5.

[illegible] ration of a robotics and [illegible] *Latin American Conference on Automatic Control*, Viña del Mar, Chile, Nov. 1998, pp. 505-510.

Bergerman, M.; Xu, Y.; Liu, Y.-H. [illegible] IEEE/RSJ [illegible] *International Conference on Intelligent Robots and Systems*, Victoria, B.C., Canada, October 1998, pp. 443-448.

[illegible] *Brazilian Conference on Automation*, Uberlândia, MG, Brazil, September 1998, pp. 79-84.

Bergerman, M.; Xu, Y.; Liu, Y.-H. [illegible] *Workshop on Robotics and Mechatronics*, Shatin, Hong Kong, September 1998, vol. 1, pp. 279-286. (Invited article)

[illegible] *International Workshop on Advanced Motion Control*, Coimbra, Portugal, June 1998, pp. 694-699.

Ramos, J.J.G; Bueno, S.S; Maeta, S.M.; Paiva, E.C.; Asanuma, K., Nascimento, L.G.; Bergerman, M.; Elfes, A.; Beiral, [illegible] *Airship Convention and Exhibition*, Bedford, UK, June 1998, pp. 91-103.

[illegible] autonomous robotic airship for environmental [illegible] *International Conference on Robotics and Automation*, Leuven, Belgium, May 1998, pp. 3449-3455.

[illegible] *International Congress on Informatics in Education*, Havana, Cuba, February 1998, paper n. 051.

[illegible] ISPE/IEEE *International Conference on CAD/CAM, Robotics, and Factories of the Future*, Pereira, Colombia, December 1997, pp. 161-171.

[illegible] *Brazilian Symposium on Informatics and Education*, São José dos Campos, SP, Brazil, November 1997, pp. 703-715.

[illegible] *Brazilian Conference on Intelligent Automation*, Vitória, ES, Brazil, September 1997, pp. 424-429.

[illegible] IEEE/RSJ *International Conference on Intelligent Robots and Systems*, France, September 1997, pp. 1493-1499.

Bergerman, M.; Xu, Y.; Liu, Y. [illegible] *Workshop on Intelligent Robotics*, *XIII Brazilian Computer Society Congress*, Brasília, DF, Brazil, August 1997, pp. 156-167.

[illegible] *IEEE International Conference on Advanced Robotics*, Monterey, CA, USA, July 1997, pp. 719-724.

[illegible] -free motion of underactuated manipulators [illegible] constrained [illegible] *International Conference on Robotics and Automation*, Albuquerque, NM, USA, April 1997, pp. 549-555.

[illegible] *International Conference on Robotics and Automation*, Albuquerque, NM, USA, April 1997, pp. 2765-2770.

[illegible] *International Conference on Robotics and Automation*, Minneapolis, MN, USA, April 1996, pp. 3714-3719.

[illegible] *IEEE Conference on Control Applications*, Albany, NY, USA, September 1995, pp. 500-505.

[illegible] *International Symposium on High Voltage Engineering*, Graz, Austria, August 1995, article 6323.

[illegible] *International Conference on Intelligent Robots and Systems*, Pittsburgh, PA, USA, August 1995, vol. 2, pp. 312-317.

[illegible] *Systems, Man and Cybernetics Conference*, Texas, USA, October 1994, pp. 925-930.

Bergerman, M.; Cruz, J. [illegible] *International Workshop on Advanced Motion Control*, Berkeley, CA, USA, March 1994.

[illegible] *Brazilian Symposium on Intelligent Automation*, Rio Claro, SP, Brazil, September 1993, pp. 141-145.

[illegible] *International Conference on the Industrial Applications of Electricity*, São Paulo, SP, Brazil, June 1992.

Berge[illegible] *International Symposium on Industrial Automation*, Lima, Peru, October 1991.

[illegible] *National Conference on Applied and Computational Mathematics*, Águas de Lindóia, SP, Brazil, November 1990, pp. 147.

Other Publications

[illegible] *Pittsburgh Post-Gazette*, Pittsburgh, PA, USA, [illegible] November 2008.

Bergerman, M. [illegible] *Proceedings of the IEEE*, vol. 96, no. 4, April 2008, pp. 549-550.

Video Productions

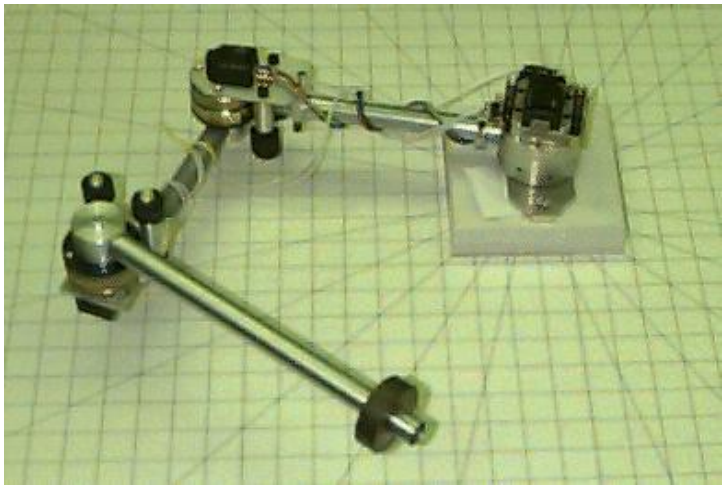
[illegible] forest aerial inspect[illegible] October 2000 [illegible]

5. Systems Built

The following are the robotic systems I designed, programmed, and built, or whose projects I managed. In all of them I was assisted (or am being assisted) by tens of researchers, students, and engineers. A complete list of names of people who worked with me on these systems is available upon request.

U-ARM: Underactuated Robot Manipulator

U-ARM is a 3-link manipulator whose joints can be dynamically configured as active or passive. Active joints are fully-actuated by a DC motor and passive joints are equipped only with an on/off brake. All joints are equipped with quadrature encoders to measure position and velocity. U-ARM was designed and built with assistance from H. Benjamin Brown, who provided all the parts. It was used at the Advanced Manipulators Laboratory at CMU to investigate nonholonomic control of robotic manipulators.

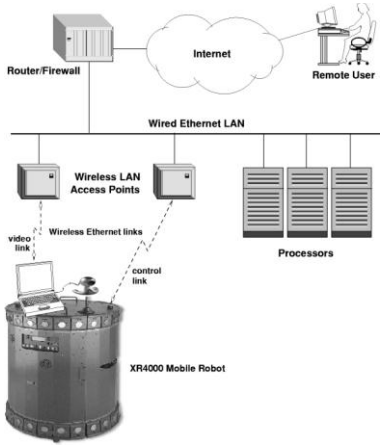


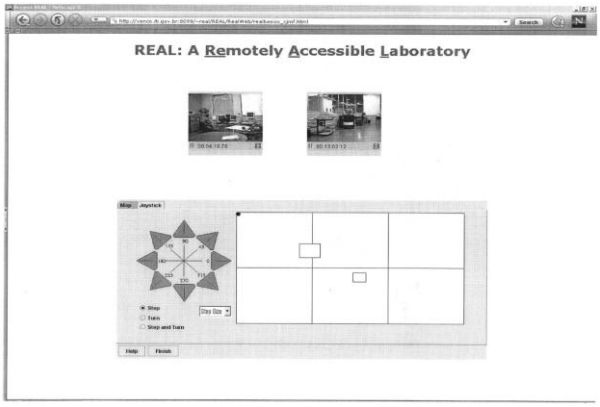
AURORA: Autonomous Unmanned Remote Monitoring Robotic Airship.

AURORA is a 30 ft. long, 10 ft. diameter robotic airship designed for environmental monitoring missions. The base vehicle is the AS800 by Airspeed Airships. Its onboard navigation and control system consists of a PC104 computer, a GPS receiver, an inertial measurement unit, a compass, and a custom wind speed sensor. To the best of my knowledge, AURORA was the first robotic airship flown under automatic control along a pre-defined route. AURORA was envisioned by Dr. Alberto Elfes, now at JPL. In cooperation with Dr. Samuel Bueno and Dr. Josué Ramos, I secured the funding and saw the development of the project between 1997 and 2000.

REAL: A Remotely-Accessible Laboratory

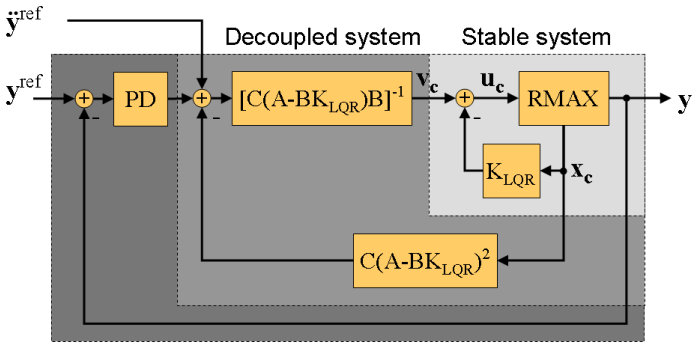
Brazil is a large country (larger than the 48 continental US states) that in 1997 had only a handful of commercial mobile robots available for [illegible] nearby Campinas State University. We created REAL to make the robot available on the Internet to researchers located anywhere in the country. The system allowed remotely located researchers to upload C code to the robot located in our lab, execute experiments, and download sensor data for analysis and documentation. REAL was built partially under my supervision by Dr. Eliane Gomes Guimarães, Mr. Luciano Rodrigues de Queiroz, and students.

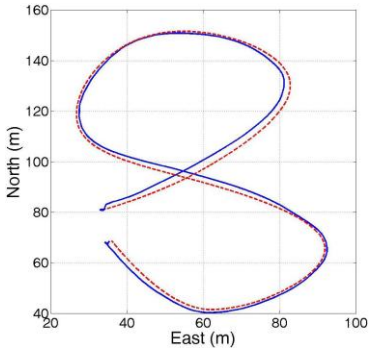




Unmanned Helicopter Navigation and Control

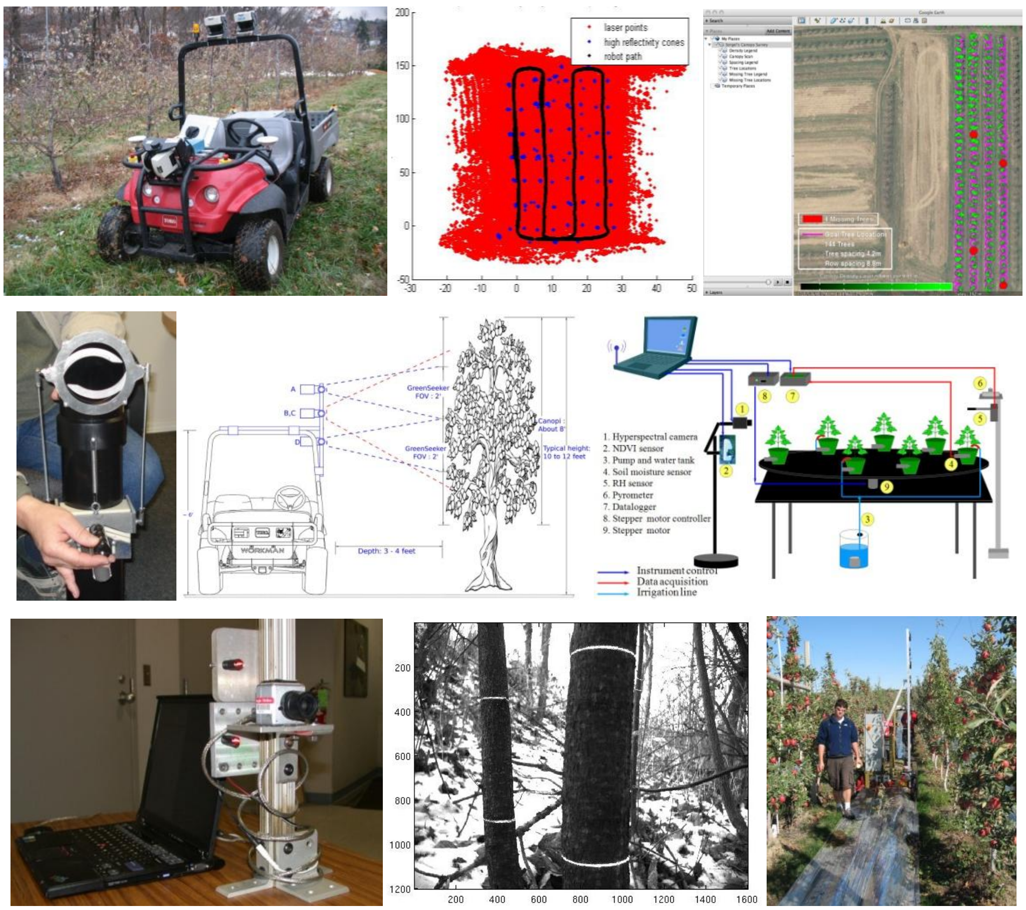
At the Autonomous Helicopter Laboratory at CMU I developed a novel, model-based, cascaded position and heading control method for the RMAX unmanned helicopter. The method is composed of three control loops. The inner-loop uses a linear quadratic regulator to stabilize the right-hand plane poles; the intermediate loop uses a feedback linearization controller to decouple the input/output pairs; finally, the outer loop uses a proportio [illegible] navigation system for greater accuracy.





Automation for Specialty Crops

¦ ÿ Ř Ŝ NJ ű K Ŝ f Ŝ Ł Ř Ŝ NJ ă K ʎ LJ ƻ Ŧ t NŜ ƻ K Ŧ Ŝ Q ÿ ă ʎ Ø Ŝ Ƨ ʎ Ø z ű ƻ Ɏ ÿ ŧ K ƻ ÿ Ɏ ƻ NJ Ł ƻ Ŝ Ŝ
million project devoted to the development of a portfolio of technologies for specialty crops. These technologies include autonomous mobility, accurate localization, information management and decision-making augmented harvesting, plant stress and disease detection, insect infestation detection, automated calipers, and autonomous crop load scouting. This USDA-funded project also includes socio-economic analyses and outreach components to foster technology traÿ ă ʎ ű ʎ ƻ ÿ Φ ! Ɏ ƻ ÿ Ǝ ű K Ŝ LJNJ ƻ Ƨ Ŝ Ŏ ű Ω ă м н ű Ŝ Ŏ K ÿ ʎ Ŏ Ł f Ł
Validation, bringing together different technologies produced by various groups across the country into complete systems.



6. Research Grants

Co-Principal Investigator, Comprehensive Automation for Specialty Crops. US Dept. of Agriculture, 2008. Grant: $12 million ($6 million in federal funds and $6 million in non-federal matching funds).

Co-Investigator, Fault detection and isolation for post-failure control of co-operative robotic manipulators. FAPESP, Brazil, 2000. Grant: US$58,000.

Principal Investigator, Semi-Autonomous Robotic Vehicles. FAPESP, Brazil, 1998. Grant: US$570,000.

Co-Investigator, Fault detection and isolation for post-failure control of robotic manipulators, FAPESP, Brazil, 1998. Grant: R$31.000.

7. Teaching Experience

Undergraduate-level courses: Servomechanisms and Robotics, Control Systems and Automation, Industrial Process Control, Control Systems Laboratory, and Automation Laboratory at the University of São Paulo and the Paulista University, Brazil.

> These courses were attended by some 30-50 students each. For all of them I was responsible for the syllabus, lectures and recitations, homework and exams preparation and grading, and assigning final grades. In all of them I prepared extensive courseware, including lecture notes and a DC motor and a robot manipulator simulator in Matlab.

Teaching Assistant for the graduate-level courses Computer Control Systems Design Laboratory, with Dr. Bruce Krogh, and Robot Control, with Dr. Yangsheng Xu, both at Carnegie Mellon University, Pittsburgh, PA.

> These courses were attended by ~20 students each. For both I was responsible for homework and exams grading. For the first one I was responsible for lab setup and for helping the students with their experiments and final demonstration.

Short-term course Fault-Tolerant Control of Robotic Manipulators at 13th Brazilian Automation Congress, Florianópolis, Brazil, September 2000.

> This 3-hour short course was created in cooperation with Dr. Marco Terra and attended by ~60 undergraduate and graduate students from several Brazilian universities. It included the free distribution of the Matlab robot manipulator simulator I developed during my PhD dissertation.

8. Student Advisory Experience

Ph.D. Students (co-advisor)

Eliane Gomes Guimarães, An Internet-based services framework for remotely accessible laboratories. State University of Campinas, Brazil, 2004.

Renato Tinós, Fault tolerance for cooperative robotic manipulators. University of São Paulo, Brazil, 2003.

M.Sc. Students (advisor)

Agemilson Pimentel Silva, DSP-based implementation of an OFDM communication system. Federal University of Amazonas, Brazil, 2004.

Anastacio Mota Cavalcante, MC-CDMA: A multicarrier communication system for channel sharing. Federal University of Amazonas, Brazil, 2004.

Rodrigo Ribeiro de Oliveira, Automatic test pattern generation for the ÁGATA system. Federal University of Amazonas, Brazil, 2004.

Luiz Gustavo Bizarro Mirisola, Development of [illegible] Brazil, 2001.

Christian Manrich, A control architecture for cooperative robots. State University of Campinas, Brazil, 2001.

Benjamin Franklin, Artificial culture: evolutionary computing, social metaphors, and their application to robotics. Technology Research Institute, Brazil, 2000.

Luciano Rodrigues de Queiroz, A robotics and computer vision virtual laboratory. State University of Campinas, Brazil, 1998.

M.Sc. Students (co-advisor)

Diogo Zandonai, A hardware-based architecture for motion estimation applied to digital video compression. Federal University of Rio Grande do Sul, Brazil, 2003.

Luiz Poffo, An environment for digital signal processing education and learning. Federal Center for Technical Education, Brazil, 2002.

Benedito Carlos de Oliveira Maciel, Supervisor. Optimal control of underactuated manipulators via actuation redundancy. University of São Paulo, Brazil, 2001.

Adriano Almeida Gonçalves Siqueira, Infinity control of an underactuated robotic manipulator. University of São Paulo, Brazil, 2001.

Undergraduate Students

Supervised 12 senior project theses at the Departments of Electrical Engineering, Computer Science, and Mechanical Engineering, Universities of São Paulo and Campinas, in the areas of robot design, control, and navigation, fault tolerance, hardware and software architectures, multimedia, sensors, and interfaces.

9. Fellowships Awarded

Young Investigator Fellowship, FAPESP, Brazil, August 1998 – January 2001.

Post-Doctoral Fellowship, FAPESP, Brazil, May 1997 – July 1998.

Post-Doctoral Fellowship, CNPq, Brazil, February – April 1997.

Doctoral Scholarship, CNPq, Brazil, August 1992 – December 1996.

Master Program Scholarship, FAPESP, Brazil, March 1989 – July 1991.

Undergraduate Research Scholarship, FAPESP, Brazil, August 1988 – December 1990.

10. Participation in Scientific and Technical Committees

President of the Organizing Committee for the 4th FIRA Robocup, Campinas, SP, Brazil, August 1999.

Member of the Organizing Committee for the Workshop on the Global Integrated Circuit Design Market, Manaus, Brazil, November 2001; and the 15th International Conference on CAD/CAM, Robotics, and Factories of the Future, Águas de Lindóia, Brazil, August 1999.

Member of the Program Committee for the 2004 and 2002 Brazilian Automation Conferences; the IEEE International Conference on Mechatronics and Machine Vision in Practice, Hong Kong, August 2001; the 2000 and 2001 Congress on Evolutionary Computation; the 4th World Multiconference on Systemics, Cybernetics and Informatics, Orlando, FL, USA , July 2000.

Member of the Editorial Board, Robotics Journal, Portugal, 2000 – 2001.

11. Reviewing Activities

Reviewer for the journals: IEEE Transactions on Robotics, Journal of Mechanism and Machine Theory, Journal of the Electronics and Telecommunications Research Institute, Journal of Field Robotics, Robotica, IEEE Transactions on Robotics and Automation, Autonomous Robots, Control and Automation, International Journal of Robotics Research, Journal of Robotic Systems, Journal of the Brazilian Computer Society, Journal of Intelligent and Robotic Systems, Automatica, ASME Journal of Dynamic Systems, Measurement, and Control, IEEE Transactions on Control Systems Technology.

Reviewer for the conferences: IEEE International Conference on Intelligent Robots and Systems, IEEE International Conference on Robotics and Automation, Conference on Human-Robot Interaction, International Congress on Evolutionary Computation, Mediterranean Conference on Control and Automation, Brazilian Mechanical Engineering Congress, Brazilian Automation Congress, World Multiconference on Systemics, Cybernetics and Informatics, Latin American Congress on Automatic Control, SIBGRAPI, Brazilian Symposium on Intelligent Automation, IEEE Conference on Decision and Control.

t l· ű Ŝ y˝ ű NJ Ŝ Ø ƛ Ŝ ø Ŝ NJ Ŧ ƨ NJ / a ¦ Ω ă / Ŝ y˝ ű Ŝ NJ Ŧ ƨ NJ ¢ Ŝ Ŏ K y˝ ƨ f ƨ Ǝ è ¢ NJ l· y˝ ă Ŧ

12. Professional Memberships

Senior Member of the Institute of the Electrical and Electronic Engineers

Member of the Brazilian Automatic Control Society

Member of the International Federation of Automatic Control (IFAC)

Member of the Brazilian Scientific Society (SBPC)

13. Languages

Portuguese: Fluent

English: Fluent

Spanish: Good reading and conversational skills

Contact: marcel@cmu.edu