

## SILDOMAR TAKAHASHI MONTEIRO

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Australian Centre for Field Robotics  
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### RESEARCH INTERESTS

Machine learning and computational intelligence algorithms with applications in signal and image processing, remote sensing and robotics.

### EDUCATION

**Ph.D.**, Dept. of Mechano-Micro Engineering, 03/2007

Tokyo Institute of Technology, Japan

Dissertation: “Computational Intelligence for Optimization and Analysis of High Dimensional Spectral Imagery” (Advisor: Prof. Yukio Kosugi)

**M.Sc.**, Dept. of Electronic Engineering and Computer Science, 06/2002

Instituto Tecnológico de Aeronáutica, Brazil

Thesis: “Study of performance of learning algorithms under conditions of sensorial ambiguity” (Advisor: Prof. Carlos H. C. Ribeiro)

**B.S.** in Electrical Engineering, 10/1999

Universidade Federal do Amazonas, Brazil

**Bach.** in Information Technology, 02/1998

Universidade do Estado do Amazonas, Brazil

### EXPERIENCE

**Research Fellow**, 03/2008 – present

Rio Tinto Centre for Mining Automation, Australian Centre for Field Robotics  
University of Sydney, Australia

**Postdoctoral Researcher**, 04/2007 – 03/2008

Interdisciplinary Graduate School of Science and Engineering  
Tokyo Institute of Technology, Japan

**Research Assistant**, 06/2004 – 05/2005

Human Centric Laboratory, Corporate Research & Development Center  
Toshiba Corporation, Kawasaki, Japan

**Software Engineer**, 07/2002 – 03/2003

SIVAM (Amazon surveillance system)  
Atech Tecnologias Críticas, Manaus, Brazil

**Systems Analyst / Programmer**, 01/1998 – 11/1999

Economy and Finance Department at Manaus City Council  
ISAE/FGV, Manaus, Brazil

## AWARDS

- **Postdoctoral fellowship for foreign researchers**, Japan Society for the Promotion of Science (JSPS), 10/2007 – 03/2008.
- **Doctoral research scholarship**, Ministry of Education, Culture, Sports, Science and Technology of Japan (MONBUSHO), 04/2003 – 03/2007.
- **Master's degree scholarship**, Research Support Foundation of the São Paulo State (FAPESP), 08/2000 – 06/2002.

## GRANTS

- **Japan Society for the Promotion of Science**, Grant-in-Aid for JSPS Fellows, “Study on High-Performance Parallel Particle Swarm Optimizers for Hyperspectral Data Analysis,” ¥1,100,000 yen/year (approx. US\$10,500), 10/2007 – 03/2008.

## PUBLICATIONS (peer-reviewed)

### JOURNAL ARTICLES

- (1) T. Edanaga, Y. Minekawa, **S.T. Monteiro** and Y. Kosugi, “Studies on human skin extraction from hyperspectral data using particle swarm optimization,” *Journal of the Japan Society of Photogrammetry and Remote Sensing*, v. 47, n. 3, pp. 23-36, 2008.
- (2) **S.T. Monteiro** and Y. Kosugi, “Particle Swarms for Feature Extraction of Hyperspectral Data,” *IEICE Transactions on Information and Systems*, v. E90-D, n. 7, pp. 1038-1046, 2007.
- (3) **S.T. Monteiro**, Y. Minekawa, Y. Kosugi, T. Akazawa, and K. Oda, “Prediction of Sweetness and Amino Acid Content in Soybean Crops from Hyperspectral Imagery,” *ISPRS Journal of Photogrammetry & Remote Sensing*, v. 62, n. 1, pp. 2-12, 2007.
- (4) **S.T. Monteiro**, K. Uto, Y. Kosugi, N. Kobayashi, and E. Watanabe, “Optimization of Infrared Spectral Manipulation for Surgical Visual Aid,” *Journal of Japan Society of Computer Aided Surgery*, vol. 8, no. 1, pp. 33–38, 2006.
- (5) **S.T. Monteiro**, K. Uto, Y. Kosugi, N. Kobayashi, E. Watanabe, and K. Kameyama, “Feature Extraction of Hyperspectral Data for Under Spilled Blood Visualization Using Particle Swarm Optimization,” *International Journal of Bioelectromagnetism*, vol. 7, no. 1, pp. 232–235, 2005.
- (6) **S.T. Monteiro** and C. H. C. Ribeiro, “Desempenho de Algoritmos de Aprendizagem por Reforço sob condições de Ambigüidade Sensorial em Robótica Móvel” (Performance of reinforcement learning algorithms in mobile robotics under conditions of sensorial ambiguity), *Journal of Control & Automation of the Brazilian Society of Automatics*, vol. 15, no. 3, pp. 320–338, 2004. (in Portuguese)

## CONFERENCE PAPERS

- (7) **S.T. Monteiro**, K. Uto, Y. Kosugi, K. Oda, Y. Iino and G. Saito, “Hyperspectral image classification of grass species in Northeast Japan,” in *Proc. of the IEEE International Geoscience and Remote Sensing Symposium*, Boston, USA, 2008.

- (8) Y. Kosugi, D. Gullaume, Y. Takabayashi, **S.T. Monteiro**, M. Yamaki, K. Uto and G. Saito, “Low-altitude hyperspectral imaging of Naruko integrated field for the interpretation of high-altitude observations,” *Proc. 6<sup>th</sup> Intl. Symposium on Integrated Field Science*, p.A-2, Sendai, Japan, 2008.
- (9) **S.T. Monteiro** and Y. Kosugi, “A particle swarm optimization-based approach for hyperspectral band selection,” in *Proc. of the 2007 IEEE Congress on Evolutionary Computation*, pp. 3335-3340, Singapore, 2007.
- (10) **S.T. Monteiro** and Y. Kosugi, “Applying particle swarm intelligence for feature selection of spectral imagery,” *the 7<sup>th</sup> International Conference on Intelligent Systems Design and Applications*, pp. 933-938, Rio de Janeiro, Brazil, 2007.
- (11) **S.T. Monteiro**, Y. Minekawa, Y. Kosugi, T. Akazawa, and K. Oda, “Prediction of sweetness and nitrogen content in soybean crops from high resolution hyperspectral imagery,” in *Proc. of the 2006 IEEE International Geoscience and Remote Sensing Symposium*, vol. 5, pp. 2263–2266, Denver, USA, 2006.
- (12) **S.T. Monteiro**, Y. Minekawa, Y. Kosugi, T. Akazawa, and K. Oda, “High resolution hyperspectral imagery for estimating sweetness content in soybean crops,” in *Proc. of the 2006 IEICE General Conference*, BS-6-13, SE-24, Tokyo, Japan, 2006.
- (13) Y. Kosugi, **S.T. Monteiro**, Y. Minekawa, N. Kosaka, K. Uto, T. Akazawa, G. Saito, and K. Oda, “On the search for possible applications of hyperspectral sensors,” in *Proc. of the 2005 Conf. of the Japanese Agricultural Systems Society*, vol. 21, no.2 , pp. 72–73, Tokyo, Japan, 2005. (in Japanese)
- (14) **S.T. Monteiro**, H. Nakamoto, H. Ogawa, and N. Matsuhira, “Robust mobile robot map building using sonar and vision,” in *Proc. of the 2005 JSME Conference on Robotics and Mechatronics*, 2P1-N-052, pp. 1–4, Kobe, Japan, 2005.
- (15) **S.T. Monteiro**, K. Uto, Y. Kosugi, and E. Watanabe, “Towards a surgical tool using hyperspectral imagery as visual aid,” in *Proc. of the MICCAI Workshop on Augmented Environments for Medical Imaging and Computer-aided Surgery*, pp. 97–103, Rennes, France, 2004.
- (16) **S.T. Monteiro**, K. Uto, Y. Kosugi, and E. Watanabe, “Towards applying hyperspectral imagery as an intraoperative visual aid tool,” in *Proc. of the 4<sup>th</sup> International Conference on Visualization, Imaging and Image Processing*, pp. 483–488, Marbella, Spain, 2004.
- (17) C.H.C. Ribeiro, L.F. Almeida, and **S.T. Monteiro**, “Localização e geração de mapas para robôs móveis autônomos” (Localization and map building for autonomous mobile robots), in *Proc. of the 2<sup>nd</sup> Brazilian Conference on Dynamics, Control and their Applications*, pp. 2056–2086, São José dos Campos, Brazil, 2003. (in Portuguese)
- (18) C.H.C. Ribeiro and **S.T. Monteiro**, “Aprendizagem da navegação em robôs móveis a partir de mapas obtidos autonomamente” (Learning of mobile robot navigation based on autonomously acquired maps), in *Proc. of the XXIII Brazilian Computer Society Conference*, vol. 1, pp. 152–152, Campinas, Brazil, 2003. (in Portuguese)
- (19) **S.T. Monteiro** and C.H.C. Ribeiro, “Obtenção de Mapas Cognitivos para o Robô Magellan” (Acquisition of cognitive maps for the Magellan Pro mobile robot), in *Proc. of the XIV Brazilian Automation Conference*, pp.1543–1548, Natal, Brazil, 2002. (in Portuguese)

## PATENTS

- (1) Y. Kosugi, **S.T. Monteiro**, K. Uto, and E. Watanabe, "Means and equipments for surgical viewing aid," *provisional US patent application 60/604,743 and US60/604,798*, Aug. 24, 2005.

#### **OTHER** (non-refereed)

- (1) F.T. Ramos, **S.T. Monteiro**, P.J. Hatherly, "Report on Iron Ore Rock Recognition Trials," Technical Report, ACFR, 2008.
- (2) **S.T. Monteiro** and N. Matsuhira, "Map building from sonar and vision for a real mobile robot navigation," presented at *the 3rd TokyoTech-KAIST Joint Student Workshop*, Tokyo, 2007.
- (3) **S.T. Monteiro** and Y. Kosugi, "Optimization of hyperspectral data for surgical visual aid," presented at *the Inter-COE21 for High School Students*, Tokyo Institute of Technology, Tokyo, 2005.
- (4) **S.T. Monteiro** and N. Matsuhira, "Development of the home robot map building," presented at *the 21st Century COE Eight Universities Joint Symposium*, Waseda University, Tokyo, 2005.

#### **MEMBERSHIPS**

- Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Geoscience and Remote Sensing Society (GRSS)
- IEEE Computational Intelligence Society (CIS)

#### **SERVICE**

- Reviewer for the IEEJ Transactions on Electrical and Electronic Engineering, 2007-2008
- Reviewer on the Brazilian Automation Conference (CBA) 2006
- Reviewer on the Brazilian Symposium on Artificial Neural Networks (SBRN) 2004

#### **COMPUTER SKILLS**

- Proficient in Matlab and C.
- Experience in Linux, UNIX, Pascal/Delphi, SQL/Oracle, HTML, UML, and Latex.

#### **LANGUAGES**

- English: fluent
- Portuguese: native
- Japanese: intermediate