

Curriculum Vitae

Rawichote Chalodhorn

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Research Interests

- Humanoid robotics
- Neurorobotics, neuroprosthesis and rehabilitation
- Dimensionality reduction

Education

- Ph.D. Eng. in Humanoid Robotics, Jun-09
Osaka University, Japan
- M. Eng. in Mechanical Engineering, Oct-98
King Mongkut's University of Technology Thonburi, Thailand
- B. Eng. in Mechanical Engineering, May-95
King Mongkut's University of Technology Thonburi, Thailand

Awards and Honors

- Journal of Neural Engineering: May-09
- Highlights of 2008: Control of a humanoid robot by a noninvasive brain-computer interface
- RoboCup 2004, Lisbon, Portugal, Humanoid league: Jul-04
- First place, H-80 Class, penalty kick competition
- Second place, best humanoid award
- RoboCup 2003, Padua, Italy, Humanoid league: Jul-03
- First place, H-80 Class, penalty kick competition
- Second place, best humanoid award
- Second place, best humanoid award
- RoboCup 2002, Fukuoga, Japan, Humanoid league: Jul-02
- Second place, H-80 Class, penalty kick competition

Awards and Honors

- Matsuda Yosahichi memorial foreign student scholarship (Japan) Apr-03
- Ninety-nine Asian foundation foreign student scholarship (Japan) Apr-02

Practical Robotics System Experience

- Fujitsu Humanoid robotics system (HOAP-1 and HOAP-2 robots): Apr 02 - present
 - Onboard vision system development.
 - Onboard power supply system development.
 - High performance onboard computer development.
 - Primitive level and high level robot behaviors development.
- Custom designed humanoid robot NUS-BIP III (in Singapore) Jul 07 - Mar 08
 - Walking algorithm for flat terrain, stair case and slope.
 - Force control jumping algorithm.
 - Online motion stabilizer
- Direct drive manipulator: Aug 96 - Mar 99
 - Kinematics and dynamics analysis.
 - Real-time nonlinear controller development.
- Redundant robotics manipulator (snake robot): Jan 97 - May 97
 - Onboard servo controller and power amplifier development.
- Omni-directional mobile base robot: Sep 96 - Nov 96
 - Kinematics analysis.
 - Onboard computer development.
 - Overall system integration
- Industrial robotics manipulator for education: Jul 94 - May 95
 - Kinematics analysis.
 - Servo controller and power amplifier development.
 - Graphic user interface development.

Employment History

- Research fellow, National University of Singapore, Singapore Jul 07 - Mar 08
- Visiting scientist, University of Washington, USA Nov 04 - Oct 06
- Research assistant, Osaka University, Japan Apr 02 - Oct 04
- Software engineer, Filonet Korea incorporated, Korea Aug 00 - Sep 01

Employment History

- Instructor, Sirindhorn International Institute of Technology, Thailand Apr 99 - Mar 00
- Research assistant, King Mongkut's University of Technology Thonburi, Thailand Aug 96 - Mar 99

Courses Taught

- Robotics technology and manufacturing automation
- Engineering drawing
- Computer aided design for mechanical engineering
- Mechanical engineering laboratory
- Mechanical engineering dynamics

Computer Skills

- Computer languages: C++, C and Java
- Analytical tools: MATLAB and Mathematica
- Dynamics simulator: Webots

Intensive Programming Experience

- Applications development on real-time Linux (RTLinux)
- Network programming (Java)
- Graphic user interface (Java Swing)
- Security Programming; Secure socket layer (SSL), symmetric key (DES key), asymmetric key (RSA key).

Publication List

Book Chapters

1. **An algorithm that recognizes and reproduces distinct types of humanoid motions based on periodically-constrained nonlinear PCA**, Chalodhorn, R., MacDorman, K. F. and Asada M., In D. Nardi, M. Riedmiller, C. Sammut, & J. Santos-Victor, RoboCup 2004: Robot Soccer World Cup VIII (Lecture Notes in Artificial Intelligence, Vol. 3276), pages 370-380. Berlin: Springer.

Publication List

Journal Articles

1. **Control of a humanoid robot by a noninvasive brain-computer interface**, Bell, C.J., Shenoy, P., Chalodhorn, R., Rao, R.P.N., *J. Neural Eng.* 5 (2008) 214-220.
2. **Learning to Walk by Imitation in Low-Dimensional Subspaces**, Chalodhorn, R., Grimes, D. B., Grochow, K., Rao, R. P. N., (accepted).
3. **Motion Recognition and Reproduction of Humanoid Robot**, Chalodhorn, R., MacDorman F. K., Asada M., *Advanced Robotics*, 23 (2009), 349–366.

Conference Articles

1. **Using Eigenposes for Lossless Periodic Human Motion Imitation**, Chalodhorn, R. and Rao, R. P. N., (to be appeared in IROS 2009)
2. **Learning to Walk through Imitation**, Chalodhorn, R., Grimes, D. B., Grochow, K., Rao, R. P. N., In Proc. of the Twentieth International Joint Conference on Artificial Intelligence (IJCAI), 2007.
3. **An Image-based Brain-Computer Interface Using the P3 Response**, Bell, C.J., Shenoy, P., Chalodhorn, R., Rao, R.P.N., In Proc. of the 3rd International IEEE EMBS Conference on Neural Engineering of the IEEE Engineering in Medicine and Biology Society (NER), 2007.
4. **Dynamic Imitation in a Humanoid Robot through Nonparametric Probabilistic Inference**, Grimes, D. B., Chalodhorn, R., Rao, R. P. N. In Proc. of Robotics: Science and Systems (RSS), 2006.
5. **Learning Humanoid Motion Dynamics through Sensory-Motor Mapping in Reduced Dimensional Spaces**, Chalodhorn, R., Grimes, D. B., Maganis, G., Rao, R. P. N. and Asada M., In Proc. of IEEE International Conference on Robotics and Automation (ICRA), 2006.
6. **Learning Dynamic Humanoid Motion using Predictive Control in Low Dimensional Subspaces**, Chalodhorn, R., Grimes, D. B., Maganis, G. and Rao, R. P. N., In Proc. Of IEEE-RAS/RSJ International Conference on Humanoid Robots, 2005.
7. **Learning to recognize and reproduce abstract actions from proprioception**, MacDorman, K. F., Chalodhorn, R. & Ishiguro, H., Third International Conference on Development and Learning: Developing Social Brains, 2004.
8. **Automatic extraction of abstract actions from humanoid motion data**, Chalodhorn, R., MacDorman, K. F. and Asada M., In Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pages 2781-2786, 2004.
9. **Photosymbols that integrate recognition and response**, MacDorman, K. F., Chalodhorn, R., Ishiguro, H. and Asada M., In Proc. of the Fourth International Workshop on Epigenetic Robotics , Genoa, 2004.
10. **An algorithm that recognizes and reproduces distinct types of humanoid motions based on periodically-constrained nonlinear PCA**, Chalodhorn, R., MacDorman, K. and Asada M., In Proc. of the Eighth RoboCup International Symposium, 2004.

Publication List

Conference Articles

- 11. Periodic principal neural networks for humanoid motion segmentation, generalization and generation**, MacDorman, K., Chalodhorn, R., and Asada M., In Proc. of the Seventeenth International Conference on Pattern Recognition (ICPR), 2004.