

Kazutaka Takahashi

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- EDUCATION** *Ph. D. Aeronautics and Astronautics* January 2007
Massachusetts Institute of Technology, Cambridge MA
Major: Control and Estimation Minor: Biomedical Engineering
Thesis title: *Modeling cerebrocerebellar control in horizontal planar arm movements of humans and the monkey*
- Bachelor in Aerospace Engineering and Mechanics with distinction* August 1997
University of Minnesota, Twin Cities, Minneapolis, MN
- EXPERIENCE** *Postdoctoral scholar* Oct. '06 - Present
Nicholas Hatsopoulos Laboratory, Department of Organismal Biology and Anatomy
University of Chicago, Chicago, IL
- Spatiotemporal analysis of motor cortical activities recorded using multielectrode arrays and of interactions of local field potentials and unit spiking activities.
- Participant* Aug. '06
Summer course in Neuroinformatics at Marine Biology Laboratory, Woods Hole, MA
- Research Assistant* Jan. '00 - Present
Computer Science and Artificial Intelligence Laboratory (CSAIL) and
Laboratory for Information and Decision Systems (LIDS), MIT Cambridge, MA
- Analysis and modeling of primate neuromuscular systems: Modeling of cerebrocerebellar function for limb control, application of optimal or nonlinear control for primate motor system, analysis and characterization of limb kinematics.
- Teaching Assistant / Recitation Instructor* Sep. '00 - May '06
Dept. of Electrical Engineering and Computer Science (EECS) MIT, Cambridge MA
- Recitation instructor for Signals and Systems (6.003) for one semester
 - Head teaching assistant for Signals and Systems (6.003) for five semesters
 - Teaching assistant for Signals and Systems (6.003), Introduction to Communication, Control, and Signal Processing (6.011), Dynamic Systems and Control (6.241) for one semester respectively
- Teaching assistant for High Performance Computation (SMA5221)* Jan. '00 - May '00
Singapore MIT Alliance (SMA), MIT, Cambridge, MA
- Research Assistant* Jan. '98 - Jan '00
Information Control Engineering Group
Dept. Aeronautics and Astronautics, MIT, Cambridge, MA
- Dynamical system modeling of rotating machinery and turbomachinery blades
 - DSP implementation of MIMO optimal controllers for gas turbine compressor blades
- Teaching assistant for Advanced Aircraft Control (16.333)* Jan. '98 - May '98
Dept. of Aeronautics and Astronautics, MIT, Cambridge, MA

Undergraduate Research Project Jan. '97 - Aug. '97
Dept. of Aerospace Engineering and Mechanics, U of Minnesota, Minneapolis, MN

- System identification of shape memory alloy as active sensor and actuator for flexible structural control application.

Undergraduate Research Project Jan. '96 - Aug. '96
Dept. of Aerospace Engineering and Mechanics, U of Minnesota, Minneapolis, MN

- Developing algorithm and visualization C++ codes for Particle Velocimetry for mixing flows.

PUBLICATIONS **Journal papers**

- Jo S, Takahashi K, "An adaptive neuromusculoskeletal model of human arm movements (tentative title)", in preparation.
- Jo S, Takahashi K, "Neurobiological systems offer new schemes for humanoid robot design (tentative title)", in preparation.
- Takahashi K, Roitman AV, Ebner TJ, Massaquoi SG, "A model of Purkinje cell simple spiking and cerebrocerebellar control during circular hand movement", submitted to Biological Cybernetics.
- Roitman AV, Massaquoi SG, Takahashi K, Ebner TJ, "Kinematic analysis of manual tracking in monkeys: characterization of movement intermittencies during a circular tracking task", J.Neurophysiol. 2004 Feb;91(2):901-11.

Presentations

- Takahashi K, Massaquoi SG, "Neuroengineering Model of human limb control - gainscheduled feedback control approach", 46th IEEE Conference on Decision and Control, New Orleans, LA., Dec., 2007
- Takahashi K, Hatsopoulos NG, "Coproagating waves of local field potentials and single-unit spiking in motor cortex", The annual meeting, Society for Neuroscience, San Diego, CA., Nov., 2007

Conference papers/posters

- (paper) Takahashi K, Massaquoi SG, "Neuroengineering Model of human limb control - gainscheduled feedback control approach", 46th IEEE Conference on Decision and Control, New Orleans, LA., Dec., 2007
- (paper) Massaquoi, S.G., Jo, S. and Takahashi, K, "Cerebro-cerebellar implementation of gainscheduled feedback control", 45th Annual Allerton Conference, Urbana-Champaign, IL 2007
- (poster) Takahashi K, Roitman AV, Ebner TJ, Massaquoi SG, "Nonlinear anatomical cerebrocerebellar model of Purkinje cell simple spiking", The annual meeting, Society for Neuroscience, Washington D.C., Nov., 2005
- (poster) Takahashi K, Roitman AV, Ebner TJ, Massaquoi SG, "Nonlinear models of Purkinje cell simple spike and cerebrocerebellar control during primate circular arm movement", The Society of the Neural Control of Movement Annual Meeting, Key Biscayne, FL., April, 2005

INVITED TALKS

- NYU, March 2006
- University of Chicago, March 2006
- University of Minnesota, March 2006
- Tamagawa University, Dec 2007
- Tokyo Metropolitan Institute for Neuroscience, Dec 2007

AWARDS

MIT EECS - Department Special Recognition Award (2005)

MIT EECS - Frederick C. Hennie III Teaching Award (2002)

REFERENCES

Nicholas Hatsopoulos, Assistant Professor, Dept. of Organismal Biology and Anatomy,
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Health Sciences and Technology, MIT
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Timothy J. Ebner, Professor and Head, Department of Neuroscience, Visscher Chair in
Physiology, University of Minnesota
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