

Dr. Matej Gašperin

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Current Position

Postdoctoral researcher at Department of Systems and Control, Jožef Stefan Institute

Academic Education

Ph.D., Jožef Stefan International Postgraduate School, 2011.

Dissertation title: Parameter estimation in nonlinear dynamic stochastic systems

Advisor: prof. dr. Đani Juričić

Diploma degree in Electrical Engineering, University of Ljubljana, Slovenia, 2006.

Programme: Automatics

Thesis Title: Načrtovanje vodenja ogrevanja in znojenja za modelno napravo človeške noge (Design of control system for temperature and sweat simulation for a human foot manikin)

Academic positions

Teaching assistant at University of Nova Gorica, Slovenia, since 2008.

Postdoctoral Associate with Department of Systems and Control, Jožef Stefan Institute, since 2006 .

Teaching Experience

University of Nova Gorica, Slovenia

Teaching Assistant, Electronics, Fall 2008 - Fall 2011

School of Technologies and Systems, Novo Mesto, Slovenia

Teaching Assistant, Electronics, Spring 2009 - Spring 2011

Research Topics

System Identification of nonlinear dynamical models

Expectation-Maximization algorithm for Maximum-Likelihood parameter estimation

Nonlinear state estimation

Unscented Kalman filtering and smoothing

Sequential Monte-Carlo methods

Model-based prognostics of machine health and Condition monitoring

- Use of dynamical models for modeling of machine wear processes

- Model-based prediction and estimation of remaining useful life

- Application to prognostics of gear systems (see references)

Applications of system identification, mathematical modeling and simulation

- Mathematical modeling in Environmental ergonomics

- Identification of mathematical models for Wastewater treatment plant

- Model-based Decision support systems

Journal Publications

GAŠPERIN, Matej, JURIČIĆ, Đani, MUSIZZA, Bojan, MEKJAVIĆ, Igor B. A model-based approach to the evaluation of flame-protective garments. *ISA trans.*, 2008, vol. 47, no. 2, str. 198-210.

GAŠPERIN, Matej, JURIČIĆ, Đani. The uncertainty in burn prediction as a result of variable skin parameters: an experimental evaluation of burn-protective outfits. *Burns.*, 2009, vol.35, no. 7, str. 970-982

GAŠPERIN, Matej, JURIČIĆ, Đani, BOŠKOSKI, Pavle, VIŽINTIN, Jožef. Model-based prognostics of gear health using stochastic dynamical models. *Mech. syst. signal process.*, 2011, vol. 25, no. 2, str. 537-548

GAŠPERIN, Matej, JURIČIĆ, Đani, BOŠKOSKI, Pavle, VIŽINTIN, Jožef. Model-based prognostics of gear health using stochastic nonlinear dynamical models. *International Journal of Condition Monitoring (to appear)*.

Conference and Seminar Presentations

Model-Based Prognostics Under Non-stationary Operating Conditions, *Annual Conference of the Prognostics and Health Management Society 2011*, Montreal, Canada, 2011

Application of Unscented Transformation to Nonlinear System Identification, *18th IFAC World Congress*, Milan, Italy, 2011

Condition Prognosis of Mechanical Drives Based on Nonlinear Dynamical Models, *Conference on Control and Fault-Tolerant Systems*, Nice, France, 2010

Model-Based Prognostics of Mechanical Drives: The Maximum-Likelihood Approach, *Nineteenth International Electrotechnical and Computer Science Conference*, Portorož, Slovenia, 2010.

System Identification of Nonlinear Dynamical Models: Application to Wastewater Treatment Plant, *2010 IEEE Multi-Conference on Systems and Control*, Yokohama, Japan, 2010.

Model-based prognostics of gear health using stochastic nonlinear dynamical models, *The Seventh International Conference on Condition Monitoring and Machinery Failure Prevention Technologies*, Stratford-upon-Avon, Great Britain, 2010.

Prognosis of gear health using stochastic dynamical models with online parameter estimation, *Annual Conference of the Prognostics and Health Management Society*, San Diego, USA, 2009.

Prognosis of gear health using dynamic model and Expectation-Maximization algorithm for parameter estimation, *10th International PhD Workshop on Systems and Control*, Czech Republic, 2009.

Decision Support System for Polymerization production plant using kPIs, *16th Mediterranean Conference on Control and Automation*, Ajaccio, France, 2008

A Novel Approach to Model-Based Evaluation of flame protective Clothing, *International Conference on Environmental Ergonomics*, Piran, Slovenia, 2007.

Evaluation of fire protective garments by using instrumented mannequin and model-based estimation of burn injuries, *15th Mediterranean Conference on Control and Automation*, Athens, Greece, 2007

Evaluation of fire protective garments using model-based estimation of burn injuries, *8th International PhD Workshop on Systems and Control*, Balatonfüred, Hungary, 2007

Sistem za vrednotenje zaščitnih oblačil, *Avtomatizacija v industriji in Gospodarstvu*, Maribor, Slovenia, 2007.

Estimation of Burn Injuries from Temperature Measurements used in Evaluation of Fire Protective Garments, *EUROSIM Congress*, Ljubljana, Slovenia, 2007.

Workshops Attended

Modelbasierte Kalibriermetoden, Technische Universität Wien, Vienna, 2010

Nonlinear Dynamics in Biological Networks, CAMBAM-MBI Summer School, Montreal, Canada, 2010.

Cancer Systems Biology, Molecular Mechanisms and Mathematical Modelling Rostock, Germany, 2009

2nd International Workshop on Systems Biology, Hamilton Institute, Ireland, 2008

2nd PhD School in Hybrid Systems, Sienna, Italy, 2007.

Honors, Awards & Fellowships

Special prize for INNOVATIONS FOR ECONOMY, 2010.

ISA Transaction Best paper of the year award, 2009.

Scholarship, Jožef Stefan Institute, 2002-2006.

Ministry of Higher Education award for Perspective Students, 2005.

First prize at the International Cultural and Academic Meeting of Engineering Students, Istanbul, Turkey, 2005.

Other Professional Activities

Conference Organization

Organizer and Editor of 9th International PhD Workshop on Systems and Control: a Young Generation Viewpoint, Izola, Slovenia 2008

Reviewing: Conference Papers

2010 IEEE Conference on Decision and Control, 15th IEEE Mediterranean Control Conference, 9th International PhD Workshop on Systems and Control: a young generation viewpoint