André Carvalho Bittencourt

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SUMMARY

Last year PhD student in Sensor Informatics and Control with expertise in systems & control, diagnostics, modeling, signal processing, data mining, machine learning and robotics. Experience in applied research, project management and leadership.

EDUCATION

PhD, Automatic Control *(Jul 2009 – Jul 2014)* Linköping University
Five year program divided in research (40%), coursework (40%) and teaching (20%).

Exchange, Automatic Control *(Mar 2007 – Dec 2007)* Royal Institute of Technology
One year exchange program, participated in an internship at ABB Corporate Research.

BSc, Automatic Control *(Mar 2003 - Dec 2008)* Federal Uni. of Santa Catarina, Brazil
Five year undergraduate program with focus in control and automation.

PRH34 *(Jan 2006 - Jan 2007)* Petroleum National Agency. Florianópolis, Brazil.
Complimentary program designed to offer a differentiated undergraduate education through courses and research aiming the oil and gas Industries.

SELECTED EXPERIENCES

PhD, Linköping University, Automatic Control *(Jul 2009 - current)* Linköping, Sweden
Applied research in diagnostics of industrial robots in collaboration with ABB.

Consultant, ABB Robotics *(Jun 2012 – Aug 2012)* Västerås, Sweden
Design and implementation of a robot diagnostics design toolbox. Given different databases and methods, process data automatically and generates comparison reports.

Research Intern, Royal Institute of Technology *(Sep 08 – Apr 09)* Stockholm, Sweden
Investigation of fault detection methods for sensors that output pre-processed data.

Thesis worker, ABB Corporate Research *(Jun 2007 – Dec 2007)* Västerås, Sweden
Modeling, identification and design of methods for friction change detection in robots.

Co-founder, Cruzeiro do Sul Development *(Apr 2006 – Jan 2007)* Brazil
Co-founder and project manager of an undergraduate development group of control solutions to improved know-how and seek for enterprise opportunities.

Participant, Electrical Eng. Special Training Program *(Aug 2004 – Mar 2006)* Brazil
Activities included coordination, organization of large events, social work and implementation of a quality program.

Participant, Control and Automation Junior Company *(Apr 2004 – Jan 2005)* Brazil

SKILLS

Expertise	control, diagnostics, robotics, modeling/identification/simulation, signal processing, sensor fusion, data analysis & statistical inference, data mining & machine learning, target tracking, optimization.
Personal	analytic capacity, proactive behavior, oral and written communication, team work, teaching and supervision.
Computing	scientific and object oriented programming, office suite.
Languages	Portuguese (native), English (fluent), Swedish/Italian/Spanish (moderate).

SELECTED PUBLICATIONS / PROJECTS

Simulation based Evaluation of Fault Detection Algorithms, *IFAC WC, 2014*
Methods for comparison of fault detection methods and determination of their practical scope.

Data-driven anomaly detection based on a bias change, *IFAC WC, 2014*
A method to infer and quantify anomaly presence given only data from nominal operation. Also provides a measure of decision uncertainty.

Condition monitoring of an industrial robot, *WO Patent 2.013.050.314, 2013.*
Methods for detecting faults in a robot.

Method for controlling an industrial process, *WO Patent 2.012.048.734, 2012.*
Methods for data mining of process operationing data for model identification.

Static Friction in a Robot Joint. *ASME Journal of Dyn. Sys., Meas., and Control, 2012*
Friction Modeling and Identification.

Identification of Wear in a Robot. *IEEE/ASME* Trans. of Mechatronics, *2014*
Method for experiment design and identification of wear in a robot gearbox verified in practical scenarios.

A data-driven approach to diagnostics of repetitive systems. *Mechatronics, 2014*
Distribution domain methods for diagnostics of repetitive systems with applications to robots and rotating machinery.

AWARDS

Best student, BSc in Automatic Control *(Dec 2008)* Florianópolis, Brazil

ACTIVITIES & INTERESTS

Mountaineering, kitesurfing, systems and control, statistical inference, teaching.

COURSES TAKEN

PhD   nonlinear systems, matrix theory, system identification, detection and estimation theory, linear systems, applied control and sensor fusion, target tracking, process control, robust MIMO control, topics in convex optimization, management of research projects, nonlinear optimization and least squares, machine learning, information theory, learning and knowledge, entrepreneurship, robotics.

Summer schools   fault diagnosis of complex systems, an advance course in lubricated wear, Gaussian process models.

MOOCs   computing for data analysis, data analysis, probabilistic graphical models.

UNDERGRADUATE TEACHING (ASSISTANT)

modeling and simulation, digital signal processing, automatic control (basic), automatic control (advanced), project in automatic control, introduction to Matlab.

SUPERVISION

D. Peretzki. **Data Mining for Process Identification**. Diplomarbeit 2, FG Mess- und Regelungstechnik, Kassel Univerisy, Kaseel, Germany, August 2010.

C. Skillsäter. **Evaluation and Configuration of a control loop asset monitoring tool**. Master's thesis LiTH-ISY-EX-11/4461-SE, Department of Electrical Engineering, Linköping University, Linköping, Sweden, April 2011.

M. Lenz and J. Rhodin. **Reliability Calculations for Complex Systems**. Master's thesis LiTH-ISY-EX-11/4441-SE, Department of Electrical Engineering, Linköping University, Linköping, Sweden, June 2011.

M. Tenerz. **Parameter Estimation in a Permanent Magnet Synchronous Motor**. Master's thesis LiTH-ISY-EX-11/4495-SE, Department of Electrical Engineering, Linköping University, Linköping, Sweden, August 2011.

I. Nielsen. **Modeling and Control of Friction Stir Welding in 5 cm thick Copper Canisters**. Master's thesis LiTH-ISY-EX-11/4567-SE, Department of Electrical Engineering, Linköping University, Linköping, Sweden, May 2012.

A. Samuelsson. **Simulation based Evaluation of Mechanical Condition Change Methods**. Master's thesis LiTH-ISY-EX-11/4575-SE, Department of Electrical Engineering, Linköping University, Linköping, Sweden, June 2012.

J. Wallin and J. Zachrisson. **Sensor Fusion in Smartphones with Application to Car Racing Performance Analysis**. Master's thesis LiTH-ISY-EX-13/4702-SE, Department of Electrical Engineering, Linköping University, Linköping, Sweden, June 2013.

C.-P. Fors. **Analysis and visualisation of validation results applied on a simulation model of Gripen's environmental control system**. Ongoing.