CV | Mahmoud ABDELRAHIM

Personal Data

Place and Date of Birth:	Egypt	10 May 1983
Work Address:	Mechanical Engineering Department, Assiut University, Assiut, Egypt
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Research Interests

- Networked control systems
- Event-triggered control
- Multi-agent systems
- Hybrid dynamical systems
- Singularly perturbed systems
- Nonlinear control
- Optimization
- Robust stabilization
- Dynamic quantization
- Mechatronics and Robotics

Education

Oct 2011-July 2014	**PhD** in Automatic Control, **CRAN-CNRS-Université de Lorraine**, France Thesis: "Output feedback event-triggered control"
2006-2010	**M.Sc.** degree in Mechatronics Engineering, **Assiut University**, Egypt Thesis: "Fuzzy Control of 2-DOF Robotic Arm"
2000-2005	**B.Sc.** in Mechatronics Enginnering, **Assiut University**, Egypt Cumulative Average Grade: 80.77/100 (with honor's degree)

Professional Positions

November 2016-present	Lecturer at the Department of Mechanical Engineering, Assiut University, Egypt
July 2015-October 2016	Post-doc at the Eindhoven University of Technology (TU/e), The Netherlands
Sep 2014-June 2015	Research and teaching assistant (ATER), ESSTIN, Université de Lorraine, France
Oct 2011-July 2014	PhD Student, CRAN-CNRS-Université de Lorraine, France
Sep 2010-Sep 2011	Assistant Lecturer, Assiut University, Egypt
Jan 2006-Sep 2010	Demonstrator, Assiut University, Egypt

Teaching Experience

Overview

Year	Position	University
2016-Present	Lecturer	Assiut University (Egypt)
2015-2016	Post-doc	TU/e (Netherlands)
2014-2015	Research and teaching assistant	ESSTIN (France)
2006-2011	Teaching assistant	Assiut University (Egypt)

- I was in charge to teach the following courses for undergraduate and graduate students:
    - Automatic Control (1)
    - Automatic Control (2)
    - Robotics
    - Introduction to Mechatronics
    - Mechatronic System Design
    - Scientific Reports Writing
    - C++ Programming
    - Digital Control
    - Advanced Control Systems
    - Engineering Analysis
    - Seminar in Mechatronics
    - Mechatronics Laboratories

Publications

Journal papers

Event-Triggered Quantized Control for Input-to-State Stabilization of Linear Systems With Distributed Output Sensors

- M. Abdelrahim, V.S. Dolk and W.P.M.H. Heemels, "~~Input-to-state stabilizing event-triggered control for linear systems with distributed and quantized output measurements~~", *IEEE Transactions on Automatic Control*, IEEE Transactions on Automatic Control, 64(12), 4952 - 4967, 2019.

"Brief Paper" (Nominally 6 pages) Not "Full Paper"

- M. Abdelrahim, R. Postoyan and J. Daafouz and D. Nešić and W.P.M.H. Heemels, "**Co-design of output feedback laws and event-triggering conditions for the L2-stabilization of linear systems**", *Automatica*, 87, 337-344, 2018.

- M. Abdelrahim, R. Postoyan and J. Daafouz and D. Nešić, "**Robust event-triggered output feedback controllers for nonlinear systems**", *Automatica*, 75, 96-108, 2017.

"Technical Paper" (normally 6 pages) Not "Full Paper"

- M. Abdelrahim, R. Postoyan, J. Daafouz and D. Nešić, "**Stabilization of nonlinear systems using event-triggered output feedback controllers**", *IEEE Transactions on Automatic Control*, 61(9), 2682-2687, 2016.

"Brief Paper" (Nominally 6 pages) Not a "Full Paper"

- M. Abdelrahim, R. Postoyan and J. Daafouz, "**Event-triggered control of nonlinear singularly perturbed systems based only on the slow dynamics**", *Automatica*, 52, 15-22, 2015.

- A. B. Sharkawy, M. M. Othman and A. A. Khalil, "**A Robust Fuzzy Tracking Control Scheme for Robotic Manipulators with Experimental Verification**", *Intelligent Control and Automation*, 2, 100-111, 2011.

Conference papers

MAS

- M. Abdelrahim, J.M. Hendrickx and W.P.M.H. Heemels, "**MAX-consensus in open multi-agent systems with gossip interactions**", *In Proceedings of the 56th IEEE Conference on Decision and Control, Melbourne, Australia*, PP. 4753–4758, 2017.

- V.S. Dolk, M. Abdelrahim and W.P.M.H. Heemels, "**Event-triggered consensus seeking under non-uniform time-varying delays**", *In Proceedings of the 20th IFAC World Congress, Invited Paper, Toulouse, France*, PP. 10096-10101, 2017.

- E.A. Escolástico, M. Abdelrahim, M. Guinaldo, S. Dormido and W.P.M.H. Heemels, "**Design of periodic event-triggered control for polynomial systems: A delay system approach**", *In Proceedings of the 20th IFAC World Congress, Invited Paper, Toulouse, France*, PP. 8159-8164, 2017.

NCS

- M. Abdelrahim, V.S. Dolk and W.P.M.H. Heemels, "**Input-to-state stabilizing event-triggered control for linear systems with output quantization**", *In Proceedings of the 55th IEEE Conference on Decision and Control, Invited Paper, Las Vegas, U.S.A*, PP. 483-488, 2016.

- M. Abdelrahim, R. Postoyan, J. Daafouz and D. Nešić, "**Event-triggered dynamic feedback controllers for nonlinear systems with asynchronous transmissions**", *In Proceedings of the 54th IEEE Conference on Decision and Control, Invited Paper, Osaka, Japan*, PP. 5494-5499, 2015.

- M. Abdelrahim, R. Postoyan, J. Daafouz and D. Nešić, "**Input-to-state stabilization of nonlinear systems using event-triggered output feedback controllers**", *In Proceedings of the 14th European Control Conference, Linz, Austria*, PP.2185–2190, 2015.

- M. Abdelrahim, R. Postoyan, J. Daafouz and D. Nešić, "**Co-design of output feedback laws and event-triggering conditions for linear systems**", *In Proceedings of the 53rd IEEE Conference on Decision and Control, Invited Paper, Los Angeles, U.S.A.* PP.3560-3565, 2014.

- M. Abdelrahim, R. Postoyan, J. Daafouz and D. Nešić, "**Stabilization of nonlinear systems using event-triggered output feedback controllers**", *In Proceedings of the 21th International Symposium on Mathematical Theory of Networks and Systems, Groningen, The Netherlands*, PP.274-281, 2014.

- M. Abdelrahim, R. Postoyan and J. Daafouz, "**Event-triggered control of nonlinear singularly perturbed systems based only on the slow dynamics**", *In Proceedings of the 9th IFAC Symposium on Nonlinear Control Systems, Invited Paper, Toulouse, France*, PP.347-352, 2013.

Book contribution

- M. Abdelrahim, R. Postoyan, J. Daafouz and D. Nešić, "**Output feedback event-triggered control**", in "Delays In Networked Control Systems", Editors: A. Seuret, L. Hetel, J. Daafouz and K.H. Johansson, Springer International Publishing Switzerland, PP.113-131, 2016.

Other research activities

- **Co-supervision:**
  - Ernesto Aranda-Escolástico (7 months), Ph.D. work on "Periodic event-triggered control for polynomial systems", Eindhoven University of Technology (TU/e), 2016.
  - Akarsh Sinha (6 months), M.Sc. thesis "Real-Time Path Planning and Collision Avoidance for Robotic Manipulators", Eindhoven University of Technology (TU/e), 2016.
  - Bo Cong (6 months), Internship thesis "Stabilizability of Discrete-time Switched Linear Systems", Eindhoven University of Technology (TU/e), 2016.

- **Reviewer for:**
  - IEEE Transaction on Automatic Control
  - Automatica
  - Journal of the Franklin Institute
  - IET Control Theory and Applications
  - IEEE Transactions on Control of Network Systems
  - Nonlinear Analysis: Hybrid Systems
  - International Journal of Robust and Nonlinear Control
  - IMA Journal of Mathematical Control and Information
  - International Journal of Systems Science
  - IEEE Conference on Decision and Control
  - European Control Conference
  - IFAC World Congress
  - American Control Conference
  - SIAM conference
  - Indian Control Conference

- **Member of jury:**
  - Stefan Heijmans, M.Sc. thesis "Interconnected Systems with Networked Communication: A Stability and Performance Analysis", Eindhoven University of Technology (TU/e), 2015.

Collaboration with the industry

- Robert Bosch GmbH company (Germany) with the ESSTIN, Université de Lorraine (Nancy, France), October 2014 - June 2015.

- Egyptian Sugar & Integrated Industries Co. (Sohag, Egypt) with Assiut University (Assiut, Egypt), August 2017 - September 2017

Presentations and invited talks

- 55th IEEE Conference on Decision and Control (CDC 2016), Las Vegas, U.S.A., Invited paper.

- 14th European Control Conference (ECC 2015), Linz, Austria.

- Réunion GT SDH-ENSAM, Invited talk "Event-triggered control of nonlinear singularly perturbed systems based only on the slow dynamics"„ Paris, France, 2015.

- 54th IEEE Conference on Decision and Control (CDC 2015), Osaka, Japan, Invited paper.

- 53rd IEEE Conference on Decision and Control (CDC 2014), Los Angeles, U.S.A, Invited paper.

- 21th International Symposium on Mathematical Theory of Networks and Systems (MTNS 2014), Groningen, The Netherlands.
- Université catholique de Louvain, Belgium, Invited talk "Output feedback event-triggered control", 2014.
- 9th IFAC Symposium on Nonlinear Control Systems, 2013 (Toulouse, France).

Training

Scientific

- ***Event-triggered and Self-triggered Control***, W.P.M.H. Heemels, K. Johansson, P. Tabuada, International Graduate School on Control 2013, EECI, Gif-sur-Yvette, France.
- ***Introduction to Nonlinear Control***, Hassan Khalil, EECI-HYCON2 Graduate School on Control 2012, Gif-sur-Yvette, France.
- ***Hybrid Dynamical Systems: Stability and Control***, Andrew Teel, EECI-HYCON2 Graduate School on Control 2012, Gif-sur-Yvette, France.

Professional

- ***TOT program: InCites & Web of Science Core Collection***, Cairo University, Cairo, Egypt, 2019.
- ***Teacher preparation training***, Assiut University, Assiut, Egypt, 2016.
- ***Dealing with work pressure***, ElroyCOM Training, Eindhoven University of Technology, Netherlands, 2015.
- ***PCDI Postdoc Retreat STEM 2015***, Postdoc Career Development Initiative (PCDI), Kapellerput, Heeze, Netherlands, 2015.
- ***Scientific writing with LaTex***, Université de Lorraine, France, 2013.

Research groups

- Mechatronics, Assiut University, Egypt: 2006 - present
- Systèmes Dynamiques Hybrides du GDR MACS, France: 2014 - present
- Control Systems Technology (CST), TU/e, The Netherlands: 2015-2016
- Control and OPtimization of HYbrid systems (COPHY), CRAN, France: 2014-2015
- Highly-complex and networked control systems (HYCON 2), France: 2012-2014

Scholarships and Projects

Sep 2013-Aug 2014	Centre de Recherche en Automatique de Nancy
Sep 2011-Jul 2013	Erasmus Mundus Flow By Flow EU-Egypt Bridge Building

Programming

MATLAB, LabVIEW, C++, FORTRAN

Languages

English:	Very good
French:	Intermediate
Arabic:	Mothertongue

Qualification

Qualified from the French National Council of Universities (CNU) to work as an assistant professor **(Maître de Conférences)** at the French universities, 61st section (Information engineering, Automatic control, Signal processing), with the qualification number: 15261271558, valid until 31 December 2019.

Professional membership

- IEEE Control Systems Society

- Egyptian Engineers Syndicate

References

- **Prof. Maurice Heemels**

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- **Prof. Jamal Daafouz**

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- **Dr. Romain Postoyan**

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