Prof. Dr.-Ing. Naim Bajcinca

CONTACT DATA

Gottlieb-Daimler-Str. 42
67663 Kaiserslautern
Tel: +49 (0)172614 8209
Tel: +49 (0)6312053230
Email: naim.bajcinca@mv.uni-kl.de

Date: 15. December 2021

CURRENT POSITION

Technische Universität Kaiserslautern
Chair of Mechatronics
Mechanical and Process Engineering

Full Professor (W3) **since October 2015**

RESEARCH

- *Theoretical / methodological research:*
  Hybrid dynamical systems: control and stability analysis and control of impulsive systems / IDEs, switched systems, stochastic IDEs, infinite and dinite dimensional; Hybrid and discrete event systems: hybrid Petrinets, decentralized supervisory control, state estimation. Network control: Lyapunov-based ISS and small-gain, event-based control, distributed optimization; Linear systems: spectral conditions for regular and descriptor systems / DAEs, Lyapunov-based criteria for parameter space approaches, PID. Control of PDEs: model order reduction, approximate method of moments, optimal control / PMP. Data-driven control: data-driven predictive control, reinforcement learning, DNN-based stochastic control.
- *Applications:*
  Cyber-physical systems: event-based protocols / TDMA, CSMA, OFDMA, AI-based condition monitoring, mixed-criticality resilience. Robotics: cooperative robot control, mobile robots; Autonomous systems: autonomous driving, SLAM-based control of mobile robots; Automotive: advanced vehicle dynamics, optimal control of plugin-hybrid vehicles, slip-control based GCC. Power systems: Demand side management, sector coupling. Process engineering: batch crystallization, optimal control of population systems, granulation; Production systems: energy efficient production, digitization /I4.0. Systems biology: multiscale cancer modeling, genomic pathways in GBM, RL- and AI-based mutation prediction for SARS-CoV-2.

EMPLOYMENT CAREER

Max-Planck Institut, Magdeburg, Deutschland

Senior research associate **Apr 2008– Sep 2015**

DLR, Institute of Robotics and Mechatronics, Oberpfaffenhofen, Deutschland

DAAD Fellowship a. Research associate **Feb 1998 – Apr 2007**

Technische Universität Berlin, Berlin, Deutschland

DAAD Fellowship **Sep 1997 – Feb 1998**

Faculty of Natural and Mathematical Sciences, Prishtina, Kosova

Research associate **Sep 1995 – Dec 1997**

GRADUATION

Technische Universität Berlin, Berlin,

PhD in Control Engineering **Sep 2005**

- Supervision: Prof. Dr. Jürgen Ackermann (DLR) und Prof. Dr. Dietrich Naunin (TU Berlin)

Faculty of Mahtematics and Natural Sciences, Prishtina, Kosova

Theoretical Physics **Apr 1995**

Faculty of Electrical Engineering, Prishtina, Kosova

Elektronics and Automation **Jan 1996**

RECENT SELECTED PUBLICATIONS

(1) Feketa, P. and **Bajcinca, N.**: *"On robustness of impulsive stabilization"*, Automatica, 2019.

(2) Bachmann, P. and **Bajcinca, N.**: *"Average dwell-time conditions for input-to-state stability of impulsive systems"*, 21th World Congress of the International Federation of Automatic Control (IFAC), Berlin, Germany, 2020.

(3) Batool, I. and **Bajcinca, N.**: *"Evolution of cancer stem cell lineage involving feedback regulation"*, PLOS ONE, April 2021.

(4) Tika, A., Gafur, N., Yfantis, V. and **N. Bajcinca**, *"Optimal scheduling and model predictive control for trajectory planning of cooperative robot manipulators"*, 21th World Congress of the International Federation of Automatic Control (IFAC), Berlin, Germany, July 2020.

(5) **Bajcinca, N.**, Modarresi, E. and Ruan, M.: *"A hybrid Petri net formalism and resource allocation in distributed control systems"*, 52nd Annual Allerton Conference, 2015.

(6) **Bajcinca, N.**: "*Analytic solutions to optimal control problems in crystal growth processes*", *Journal on Process Control*, Special Issue 18th IFAC World Congress, 2013, pp. 224-241.

(7) **Bajcinca, N.** and Voigt, M.: "*Spectral conditions for symmetric positive real and negative imaginary systems*", *European Control Conference 2013*, Zurich, Switzerland, in Proc. pp. 809-814.

(8) Kouhi, Y., **Bajcinca, N.**, Raisch, J. and Shorten, R.: "*On the quadratic stability of switched linear systems associated with symmetric transfer function matrices*", *Automatica*, 2014.

(9) **Bajcinca, N.** and Flockerzi, D.: *"Geometric approaches to state-feedback for continuous and switched linear systems"*, 15th *Asian Journal of Control*, 2015, pp. 2055-2071.

(10) M. Zakwan, S. Ahmed, and **Bajcinca, N.**: *"Dynamic L2 output feedback control of delayed LPV systems with piecewise constant parameters: A clock-dependent L-K approach"*, 15th *International Journal of Robust and Nonlinear Control*, 2020, pp. 2055-2071.