Saša V. Raković, Ph.D. DIC

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Résumé

Academic Experience

06/2017 – present	*Independent Researcher*.
10/2016 – 05/2017	**University of Porto**, Porto, Portugal *Visiting Research Scholar*, FEUP.
06/2016 – 10/2016	**Texas A&M University**, College Station, USA *Visiting Research Scholar*, Energy Institute.
05/2015 – 06/2016	**The University of Texas**, Austin, USA *Visiting Research Scholar*, Center for Space Research.
06/2017 – present	*Independent Researcher*.
07/2012 – 09/2014	**Oxford University**, Oxford, UK *Member of Senior Common Room*, St Edmund Hall.
04/2014 – 08/2014	**Supélec**, Gif–sur–Yvette, France *Visiting Research Scholar*, Automatic Control Department.
02/2012 – 07/2012	**The University of Maryland**, College Park, USA *Visiting Assistant Professor*, Institute for Systems Research.
07/2009 – 10/2011	**Oxford University**, Oxford, UK *Visiting Academic Fellow*, Control Group.
04/2009 – 12/2011	**The Otto–von–Guericke–Universität Magdeburg**, Magdeburg, Germany *Scientific Associate*, Institute for Automation Engineering.
12/2008 – 12/2009	**Imperial College London**, London, UK *Honorary Research Associate*, Centre for Process Systems Engineering.
11/2006 – 11/2008	**Eidgenössische Technische Hochschule Zürich (ETH Zürich)**, Zürich, Switzerland *Postdoctoral Researcher*, Automatic Control Laboratory.
11/2001 – 11/2006	**Imperial College London**, London, UK *Postdoctoral Research Associate*, Control and Power Group.

Education

2001 – 2005	**Imperial College London**, London, UK
Degree	*Ph.D. in Control Theory*.
Dissertation	"Robust Control of Constrained Discrete Time Systems: Characterization and Implementation".
Award	The Eryl Cadwaladr Davies Prize 2005.
2000 – 2001	**Imperial College London**, London, UK
Degree	*M.Sc. in Control Engineering, and DIC* (Diploma of Imperial College).
Thesis	"Medical Application of Feedback Control".
1993 – 1999	**The University of Kragujevac, Technical Faculty of Čačak**, Čačak, Serbia
Degree	*B.Eng. in Mechatronics*.
Final Project	"Temperature Control of an Industrial Oven".
Award	The Dr. Milivoje Urošević Fund Award 1999.

Impact Indicators (Google Scholar Statistics On December 12, 2017)

Publications	Total	95 (+10)	H–Index	28	i10–Index	54
Citations	Total	3783	Per year	236	Per publication	40
Average citations	Top 5 publications	352	Top 10 publications	230	Top 28 publications	115

Plenary Talks

Plenary Talk	*"Invention of Prediction Structures and Categorization of Robust MPC Syntheses"*
August, 2012	The 4^{th} IFAC Conference on Nonlinear Model Predictive Control 2012, NMPC'12.
Semi–Plenary Talk	*"Set–Theoretic Methods in Model Predictive Control"*
September, 2008	The 3^{rd} IFAC Conference on Nonlinear Model Predictive Control 2008, NMPC'08.

Memberships and Awards (Selected)

2011 – Present	Member of the IFAC Technical Committee on Nonlinear Control Systems.
2005	The Eryl Cadwaladr Davies Prize – The best Ph.D. thesis in the EEED of Imperial College London.
1999	The Dr. Milivoje Urošević Fund Award 1999 – The best student at the Technical Faculty of Čačak.

Current Research Focus Areas

Controls, Dynamics and Optimization
Conventional, robust and stochastic optimal and model predictive control; Optimization for analysis and synthesis of dynamic and static systems, and decision making, under constraints and uncertainty.

Smart Autonomous and Cyber–Physical Systems
Agility and composability; fault tolerance and reconfigurability; intelligent functionality; multi–system formations with collaborative and coordinated operability; reliability and safety; security and resilience.

Main Technical Expertise

Control Synthesis
Conventional, robust and stochastic optimal and model predictive control; dynamic programming.

Optimization–based Analysis and Synthesis
Design of specification, resource and performance optimal systems under constraints and uncertainty.

Set–Valued Analysis and Synthesis
Reachability and estimation; safety, reliability, security and resilience; set invariance and stability.

Distinguished Contributions

Model Predictive Control

Contributions
Robust model predictive control.
Stochastic model predictive control.
Tube model predictive control.

Set Invariance

Contributions
Minimal invariant sets.
Set invariance under output feedback.
Invariant approximations of minimal and maximal invariant sets.

Optimization–based and Set–Valued Analysis and Synthesis

Contributions
Minkowski–Lyapunov equation.
Real–time computations of invariant sets and Lyapunov functions.
Exact and approximate, backward and forward, reachability analysis under constraints and uncertainty.

Publications Breakdown

1 Ph.D. thesis	1 Edited book	1 Book review	3 Book chapters
31 Journal articles	60 Conference papers	8 in preparation	2 in review and revision

Selected Publications

[1] S. V. Raković and W. S. Levine. *Handbook of Model Predictive Control*. Birkhäuser. Currently being finalized.

[2] U. Eren, A. Prach, B. B. Kocer, S. V. Raković, E. Kayacan and B. Açikmeşe. Model Predictive Control in Aerospace Systems: Current State and Opportunities. *Journal of Guidance, Control, and Dynamics*, 40(7): 1541–1566, 2017.

[3] S. V. Raković. The Minkowski–Lyapunov Equation. *Automatica*, 75(1): 32–36, 2017.

[4] S. V. Raković. Robust Model Predictive Control. Invited Paper in *Encyclopedia of Systems and Control*: 1225–1233, 2015, Editors–in–Chief: J. Baillieul and T. Samad, Springer–Reference, 2015.

[5] S. V. Raković, B. Kouvaritakis, M. Cannon, C. Panos and R. Findeisen. Parameterized Tube Model Predictive Control. *IEEE Transactions on Automatic Control*, 57(11): 2746–2761, 2012.

[6] S. V. Raković, B. Kouvaritakis, R. Findeisen and M. Cannon. Homothetic Tube Model Predictive Control. *Automatica*, 48(8) : 1631–1638, 2012.

[7] Z. Artstein and S. V. Raković. Set Invariance Under Output Feedback: A Set–Dynamics Approach. *International Journal of Systems Science*, 42(4) : 539–555, 2011.

[8] S. V. Raković and M. Barić. Parameterized Robust Control Invariant Sets for Linear Systems: Theoretical Advances and Computational Remarks. *IEEE Transactions on Automatic Control*, 55(7) : 1599–1614, 2010.

[9] D. Q. Mayne, S. V. Raković, R. Findeisen and F. Allgöwer. Robust Output Feedback Model Predictive Control of Constrained Linear Systems: Time Varying Case. *Automatica*, 45(9) : 2082–2087, 2009.

[10] Z. Artstein and S. V. Raković. Feedback and Invariance under Uncertainty via Set–Iterates. *Automatica*, 44(2) : 520–525, 2008.

[11] S. V. Raković, E. C. Kerrigan, K. I. Kouramas and D. Q. Mayne. Invariant Approximations of the Minimal Robustly Positively Invariant Set. *IEEE Transactions on Automatic Control*, 50(3) : 406–410, 2005.

[12] D. Q. Mayne, M. M. Seron and S. V. Raković. Robust Model Predictive Control of Constrained Linear Systems with Bounded Disturbances. *Automatica*, 41(2) : 219–224, 2005.