
Education

Georgia Institute of Technology	ATLANTA, GEORGIA, USA
Doctor of Philosophy in Mechanical Engineering	2013 – 2016
Thesis Title: Input to State Stabilizing Control Lyapunov Functions for Hybrid Systems	
Committee: Aaron D. Ames (advisor), Magnus Egerstedt, Patricio Vela, Jonathan Rogers, Jun Ueda	
Texas A&M University	COLLEGE STATION, TEXAS, USA
Master of Science in Electrical and Computer Engineering	2010 – 2012
Thesis Title: Bipedal Robotic Walking on Flat-ground, Up-slope and Rough Terrain with Human-Inspired Hybrid Zero Dynamics	
National Institute of Technology Karnataka	SURATHKAL, KARNATAKA, INDIA
Bachelor of Technology in Electrical and Electronics Engineering	2004 – 2008

Experience

California Institute of Technology	PASADENA, CALIFORNIA, USA
Postdoctoral Scholar	Jan '17 – present
Working with Dr. Aaron Ames in the area of robust controller analysis for both stability and safety of hybrid systems. Also working with Miso Robotics to flip burgers!	
Tejas Networks Ltd.	BENGALURU, KARNATAKA, INDIA
R&D Engineer	Jun '08 – Jun '10
Designed and fabricated two stand alone switching power supplies	
Indian Institute of Science	BENGALURU, KARNATAKA, INDIA
Intern	May '07 – July '07
Worked as an intern in the Aerospace department involving data monitoring and logging in a Micro Air Vehicle	
GMR Thanir Bavi	MANGALORE, KARNATAKA, INDIA
Intern	May '05 – July '05
Worked as a trainee in a barge mounted power plant monitoring the transmission system	

Conference Publications

- [1] S. N. Y. Kolathaya, B. Kothapalli, and A. D. Ames. "Zeno behavior in electromechanical hybrid systems: From theory to experimental validation". In: *2012 American Control Conference (ACC)*. June 2012, pp. 2437–2442. DOI: 10.1109/ACC.2012.6315696.
- [2] Z. Huihua, S. N. Y. Kolathaya, and A. D. Ames. "Bipedal robotic running with partial hybrid zero dynamics and human-inspired optimization". In: *2012 IEEE/RSJ International Conference on Intelligent Robots and Systems*. Oct. 2012, pp. 1821–1827. DOI: 10.1109/IR0S.2012.6386241.
- [3] S. N. Y. Kolathaya, M. Pasupuleti, and A. D. Ames. "Human-inspired underactuated bipedal robotic walking with AMBER on flat-ground, up-slope and uneven terrain". In: *2012 IEEE/RSJ International Conference on Intelligent Robots and Systems*. Oct. 2012, pp. 2478–2483. DOI: 10.1109/IR0S.2012.6386182.
- [4] S. Kolathaya and A. D. Ames. "Achieving Bipedal Locomotion on Rough Terrain through Human-Inspired Control". In: *10th IEEE International Symposium on Safety Security and Rescue Robotics*. College Station, Texas, USA, Oct. 2012.
- [5] H. Zhao, S. Kolathaya, and A. D. Ames. "Quadratic programming and impedance control for transfemoral prosthesis". In: *2014 IEEE International Conference on Robotics and Automation (ICRA)*. May 2014, pp. 1341–1347. DOI: 10.1109/ICRA.2014.6907026.
- [6] A. Hereid et al. "Dynamic Multi-domain Bipedal Walking with Atrias Through SLIP Based Human-inspired Control". In: *Proceedings of the 17th International Conference on Hybrid Systems: Computation and Control*. HSCC '14. Berlin, Germany, 2014, pp. 263–272. ISBN: 978-1-4503-2732-9. DOI: 10.1145/2562059.2562143.
- [7] W. L. Ma et al. "Human-inspired walking via unified PD and impedance control". In: *2014 IEEE International Conference on Robotics and Automation (ICRA)*. May 2014, pp. 5088–5094. DOI: 10.1109/ICRA.2014.6907605. URL: <http://ieeexplore.ieee.org/document/6907605/>.

- [8] S. Kolathaya and A. D. Ames. “Exponential convergence of a unified CLF controller for robotic systems under parameter uncertainty”. In: *2014 American Control Conference*. June 2014, pp. 3710–3715. DOI: 10.1109/ACC.2014.6859407. URL: <http://ieeexplore.ieee.org/abstract/document/6859407/>.
- [9] A. D. Ames et al. “First Steps Toward Formal Controller Synthesis for Bipedal Robots”. In: *Proceedings of the 18th International Conference on Hybrid Systems: Computation and Control*. HSCC '15. Seattle, Washington, 2015, pp. 209–218. ISBN: 978-1-4503-3433-4. DOI: 10.1145/2728606.2728611.
- [10] S. Kolathaya and A. D. Ames. “Parameter Sensitivity and Boundedness of Robotic Hybrid Periodic Orbits.” In: vol. 48. 27. 2015, pp. 377–382. DOI: <http://dx.doi.org/10.1016/j.ifacol.2015.11.203>.
- [11] S. Kolathaya, A. Hereid, and A. D. Ames. “Time dependent control Lyapunov functions and hybrid zero dynamics for stable robotic locomotion”. In: *2016 American Control Conference (ACC)*. July 2016, pp. 3916–3921. DOI: 10.1109/ACC.2016.7525524.
- [12] A. Hereid, S. Kolathaya, and A. D. Ames. “Online optimal gait generation for bipedal walking robots using legendre pseudospectral optimization”. In: *2016 IEEE 55th Conference on Decision and Control (CDC)*. 2016, pp. 6173–6179. DOI: 10.1109/CDC.2016.7799218.

Journal Publications

- [1] S. Kolathaya and A. D. Ames. “Parameter to state stability of control Lyapunov functions for hybrid system models of robots”. In: *Nonlinear Analysis: Hybrid Systems* (2016). ISSN: 1751-570X. DOI: <http://dx.doi.org/10.1016/j.nahs.2016.09.003>.
- [2] A. D. Ames et al. “First steps toward formal controller synthesis for bipedal robots with experimental implementation”. In: *Nonlinear Analysis: Hybrid Systems* (2017), pp. –. ISSN: 1751-570X. DOI: <http://dx.doi.org/10.1016/j.nahs.2017.01.002>.

Peer Reviewed Book Chapters

- [1] S. N. Y. Kolathaya, M. Pasupuleti, and A. D. Ames. “From Formal Methods to Algorithmic Implementation of Human Inspired Control on Bipedal Robots”. In: *Algorithmic Foundations of Robotics X: Proceedings of the Tenth Workshop on the Algorithmic Foundations of Robotics*. Ed. by E. Frazzoli et al. Berlin, Heidelberg: Springer Berlin Heidelberg, 2013, pp. 511–526. ISBN: 978-3-642-36279-8. DOI: 10.1007/978-3-642-36279-8_31.
- [2] S. Kolathaya, W. L. Ma, and A. D. Ames. “Composing Dynamical Systems to Realize Dynamic Robotic Dancing”. In: *Algorithmic Foundations of Robotics XI: Selected Contributions of the Eleventh International Workshop on the Algorithmic Foundations of Robotics*. Ed. by H. L. Akin et al. Cham: Springer International Publishing, 2015, pp. 425–442. ISBN: 978-3-319-16595-0. DOI: 10.1007/978-3-319-16595-0_25.

Miscellaneous

- [1] S. Kolathaya et al. *Human-Inspired Walking in AMBER 1.0 and AMBER 2.0, Dynamic Walking*. 2013.
- [2] S. Kolathaya et al. *System Identification and Control of Valkyrie through SVA-Based Regressor Computation, arXiv preprint arXiv:1608.02683*. 2016.

Teaching Experience

Georgia Institute of Technology

Nonlinear Systems–Graduate Level–ECE6552

Taught four lectures, set homeworks, held weekly office hours and also graded exams

ATLANTA, GEORGIA, USA

Spring 2016

Achievements

- Best paper award (second author) for a seminal work on *Dynamic multi-domain bipedal walking with ATRIAS through slip based human-inspired control*, In the *Proceedings of the 17th international conference on Hybrid systems: Computation and Control*, 2014
 - Won first prize and second prize in the Robotic events CAPROTRACTUS (fastest line follower) and CRUISE CONTROL (fastest wall follower) held at the National Institute of Technology, Calicut, 2007
 - AIEEE all India rank: 2679, and AIEEE state rank: 64, IIT-JEE 2004: 4845
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List of Seminars and Presentations

- *From Formal Methods to Algorithmic Implementation of Human Inspired Control on Bipedal Robots*, Workshop on Algorithmic Foundations of Robotics X, Cambridge, Massachusetts, USA.
 - *Zeno behavior in electromechanical hybrid systems: From theory to experimental validation*, American Control Conference 2012, Montreal, Quebec, Canada.
 - *Human-inspired underactuated bipedal robotic walking with AMBER on flat-ground, up-slope and uneven terrain*, International Conference on Intelligent Robots and Systems 2012, Vilamoura, Algarve, Portugal.
 - *Bipedal robotic running with partial hybrid zero dynamics and human-inspired optimization*, International Conference on Intelligent Robots and Systems 2012, Vilamoura, Algarve, Portugal.
 - *Achieving Bipedal Locomotion on Rough Terrain through Human-Inspired Control*, International Symposium on Safety Security and Rescue Robotics 2012, College Station, Texas, USA.
 - *Dynamic Multi-domain Bipedal Walking with ATRIAS Through SLIP Based Human-inspired Control*, Cyber Physical Systems Week 2014, Berlin, Germany.
 - *Exponential convergence of a unified CLF controller for robotic systems under parameter uncertainty*, American Control Conference 2014, Portland, Oregon, USA.
 - *Composing Dynamical Systems to Realize Dynamic Robotic Dancing*, Workshop on Algorithmic Foundations of Robotics XI, Istanbul, Turkey.
 - *Parameter Sensitivity and Boundedness of Robotic Hybrid Periodic Orbits*, Analysis and Design of Hybrid Systems 2015, Atlanta, Georgia, USA.
 - *Time dependent control Lyapunov functions and hybrid zero dynamics for stable robotic locomotion*, American Control Conference 2016, Boston, Massachusetts, USA.
 - *Introduction to Human-Inspired Bipedal Walking*, Invited seminar 2012, National Institute of Technology Karnataka, Surathkal, Karnataka, India.
 - *Achieving Human-Inspired Bipedal Robotic Walking*, Invited seminar 2013, National Institute of Technology Karnataka, Surathkal, Karnataka, India.
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