Manish Goyal

Contact Information

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Education

Ph.D., Computer Science 01/2017 – Exp. 06/2022
Advisor: Parasara **Sridhar** Duggirala
University of North Carolina at Chapel Hill, USA

M.Tech, Computer Science and Engineering 07/2008 – 06/2010
Indian Institute of Technology Guwahati, India

Employment

[**E.7**] Graduate Assistant, Department of Computer Science
University of North Carolina, Chapel Hill, USA 01/2019 – Present
[**E.6**] Research Internship, TCS Innovation Labs, Pune, India 05/2019 – 07/2019
[**E.4**] Senior Software Engineer, Synopsys India Pvt. Ltd., NOIDA, India 06/2012 – 12/2016
[**E.3**] Research Engineer, Verimag Research Lab, Grenoble, France 02/2011 – 05/2012
[**E.2**] Associate Software Engineer, IBM India Labs, Bangalore, India 07/2010 – 01/2011
[**E.1**] Research Internship, Verimag Research Lab, Grenoble, France 05/2009 – 07/2009

Peer reviewed Conference/ Journal Publications

[**RTS'21**] C. Nemitz, T. Amert, **M. Goyal**, J. Anderson, "Concurrency Groups: A New Way to Look at Real-Time Multiprocessor Lock Nesting", *Real-Time Systems*, special issue of outstanding papers from the International Conference on Real-Time Networks and Systems 2019, to appear.

[**ATVA'20**] **M. Goyal**, P. S. Duggirala, "NeuralExplorer: State Space Exploration of Closed Loop Control Systems Using Neural Networks", *International Symposium on Automated Technology for Verification and Analysis*, 10/2020.

[**AUT'20**] **M. Goyal**, P. S. Duggirala, "Extracting Counterexamples Induced by Safety Violation in Linear Hybrid Systems", *Automatica*, 07/2020.

[**ACC'20**] **M. Goyal**, D. Bergman, P. S. Duggirala, "Generating Longest Counterexample: On the Cross-roads of Mixed Integer Linear Programming and SMT", *American Control Conference*, 07/2020.

[**L4DC'20**] **M. Goyal**, P. S. Duggirala, "NeuralExplorer: State Space Exploration of Closed Loop Control Systems Using Neural Networks", *Learning for Dynamics and Control*, 06/2020.

[**RTNS'19**] C. Nemitz, T. Amert, **M. Goyal**, J. Anderson, "Concurrency Groups: A New Way to Look at Real-Time Multiprocessor Lock Nesting", *Real-Time Networks and Systems*, 11/2019. **Outstanding Paper Award**.

[**ADHS'18**] **M. Goyal**, P. S. Duggirala, "On Generating a variety of unsafe counterexamples for Linear Dynamical Systems", *Analysis and Design of Hybrid Systems*, 07/2018.

[**IJMO'12**] **M. Goyal**, "Reachability Analysis of Hybrid Systems: An Experience Report". *International Journal of Modeling and Optimization*, Vol. 2(6), pp 681-686, 12/2012.

Other/ Workshop Artifacts

[**DARS'19**] **M.Goyal**, P. S. Duggirala, "Learning Robustness of Nonlinear Systems Using Neural Networks", *Design and Analysis of Robust Systems*, 07/2019.

[**CMACS'11**] G. Frehse, A. Donzé, S. Cotton, R. Ray, O. Lebeltel, **M. Goyal**, R. Ripado, T. Dang, O. Maler, C. Le Guernic, A. Girard, "Safety Analysis of Hybrid Systems with SpaceEx", *Computational Modeling and Analysis for Complex Systems*, 07/2011.

[**VER'12**] **M. Goyal**, G. Frehse, "Automata Library: A User Guide", VERIMAG, France, 04/2012.

[**MULTI'11**] **M. Goyal**, G. Frehse, "Translation between CIF and SpaceEx/PHAVer", MULTIFORM Deliverable D1.3.1, VERIMAG, 05/2011.

Skills

Python, C/C++, Matlab/Simulink

Travel Grants/ Awards

[**F.7**] **NSF Travel Grant** for *VMCAI Winter School*, New Orleans, Louisiana, 2020.
[**F.6**] **John Lof Leadership Academy Fellowship** by UConn School of Engineering, 2018.
[**F.5**] **UTC-IASE Graduate Fellowship** by United Technologies Corporation, 2017 & 2018.
[**F.4**] **FLEFF Travel Grant** for *Finger Lakes Environmental Film Festival*, Ithaca, NY, 2018.
[**F.3**] **SREB Travel Grant** for *Institute on Teaching and Mentoring*, Atlanta, Georgia, 2017.
[**F.2**] **NSF Travel Grant** for *Computer Aided Verification*, Heidelberg, Germany 2017.
[**F.1**] **NSF Travel Grant** for *Hybrid Systems Computation and Control*, Pittsburgh, PA, 2017.

Other Honours

[**H.4**] TarHeels@UNC secured **poll position** 1^{st} in F1Tenth, a racing competition for autonomous vehicles, conducted at Cyber-Physical Systems Week (CPSWeek) 2019.
[**H.3**] RacingHuskies secured **poll position** 2^{nd} in F1Tenth, a racing competition for autonomous vehicles, conducted at Cyber-Physical Systems Week (CPSWeek) 2017.
[**H.2**] *Department Rank holder* during Master's and Bachelor's degrees.
[**H.1**] *KUDOS Award* and *STAR Award* at Synopsys India Pvt. Ltd.

Course Projects

[**P.5**] Voronoi Diagram-based Controller for Autonomous Racing Vehicles
[**P.4**] Sensing and Homography: A different outlook
[**P.3**] Towards Falsification of Nonlinear Dynamical Systems
[**P.2**] Analyzing and implementing the Gale Transformation
[**P.1**] Spam Detection Using Probabilistic Graphical Models

Graduate Courses

Probabilistic Graphical Models, Computational Geometry, Intelligent Embedded Systems, Machine Learning, Formal Methods, Computational Photography, Robotics, Programming Intelligent Physical Systems, Safe Autonomy, Algorithm Analysis

Extra Curricular

Member At-large, STEM Pride club, UNC@Chapel Hill, 2019-2020.
Treasurer, South Asian cultural group, Tarang, UConn, 2018-2019.
Graduate Fellow, John Lof Leadership Board, UConn, 2018-2019.
Member, Student Association of Graduate Engineers (SAGE), UConn, 2018-2019.

References

Available upon request