

Nikhil Kumar Singh

CONTACT INFORMATION	D-215 Hall-8 IIT Kanpur	<i>Contact:</i> ksnikhil@iitk.ac.in, +91-8447077602 <i>GitHub:</i> https://github.com/ciniks117
RESEARCH INTERESTS	Controller Synthesis, Formal Verification, Deep Reinforcement Learning, Cyber Physical Systems, Machine Learning.	
EDUCATION	Indian Institute of Technology, Kanpur, PhD, Computer Science and Engineering, Jan 2020 - Present (9.50/10) Thesis : Specification Guided Automated Controller Synthesis for CPSs. Advisor: Dr. Indranil Saha Indian Institute of Technology, Kanpur, MS, Computer Science and Engineering, Dec 2019 (9.0/10) Thesis : Specification guided Automated Debugging of CPS Models. Advisor: Dr. Indranil Saha National Institute of Technology, Jamshedpur, B.Tech(Hons), Computer Science and Engineering, May 2014 (8.70/10) Project: Intelligent Web Search Engine.	
TECHNICAL ABILITIES	<ul style="list-style-type: none">• Languages: Python, C, C++, Scala.• Tools/Fwk : MATLAB, Simulink/Stateflow, SpaceX, BREACH, S-TALIRO, RTAMT, Py-Torch, Gym etc.• Relevant Courses Completed: Machine Learning; Data Mining; Program Analysis, Verification and Testing; Designing Verifiably Secure Systems; Formal Methods for Robotics and Automation; Embedded and Cyber-Physical Systems; Maths for Computer Science etc. .	
PUBLICATIONS	<ul style="list-style-type: none">• Nikhil Kumar Singh, Indranil Saha. “<i>Specification Guided Synthesis of Feedback Controllers.</i>” ACM SIGBED International Conference on Embedded Software (EMSOFT 2021), ACM/IEEE, virtual conference, October 08-15, 2021. Published in ACM Transactions on Embedded Computing Systems (2021) https://dl.acm.org/doi/10.1145/3477011. Code at https://github.com/iitkcpslab/SCoSyn• Nikhil Kumar Singh, Indranil Saha. “<i>Specification Guided Automated Debugging of CPS Models.</i>” International Conference on Embedded Software (EMSOFT2020), ACM/IEEE, virtual conference, September 20-25, 2020. Published in IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (2020) https://ieeexplore.ieee.org/document/9211574/. Code at https://github.com/iitkcpslab/Blars	
PROJECTS	Geo-Spatial Analysis of Twitter Data. Prof. Arnab Bhattacharya <i>As course project for Data mining course (CS685A)</i> Aug’20 - Dec’20 Star-based Abstractions for Outside-the-Box framework. Prof. Subhajit Roy <i>As course project for Program Analysis, Verification and Testing (CS639A)</i> Aug’20 - Dec’20	
MENTORED PROJECTS	Reinforcement Learning based Falsification Sudhanshu Mishra, Niskarsh Kumar <i>As course project for Autonomous Cyber-Physical Systems (CS659A)</i> Jan’21 - May’21 Adaptive Cruise Control Verification Using NNV toolbox Areeb Ahmad, Deepanker Mishra, Himanshu Singh	

	<i>As course project for Autonomous Cyber-Physical Systems (CS659A)</i>	Jan'21 - May'21
	Controller Synthesis for LTI systems	
	Raju Roy, Shashank	
	<i>As course project for Autonomous Cyber-Physical Systems (CS659A)</i>	Jan'21 - May'21
WORK EXPERIENCE	Indian Institute of Technology, Kanpur Teaching Assistant <i>Software Development (CS253)</i>	Jan'22 - May'22
	Indian Institute of Technology, Kanpur Teaching Assistant <i>Autonomous Cyber-Physical Systems (CS659A)</i>	Jan'21 - May'21
	Indian Institute of Technology, Kanpur Teaching Assistant <i>Embedded and Cyber-Physical Systems (CS637A)</i>	Sept'20 - Dec'20
	Indian Institute of Technology, Kanpur Teaching Assistant <i>Formal Methods for Robotics and Automation (CS638A)</i>	Jan'20 - May'20
	FMSAFE Project, IIT Kanpur Senior Student Research Associate <i>Sponsor: MHRD IMPRINT</i>	Jan'18 - Dec'19
	- Developed an Automated Tool BLARS for Debugging CPS Models.	
	OptumSoft, Bangalore Member Of Technical Staff	June'14 - Jun'16
	- Software Development in the domain of Distributed Systems. This involved a high-level TACC Compiler Framework.	
	- Projects related to development and maintenance of Dashboard Software.	
	- Working with the build servers.	
	HPES-IIIT Allahabad, Intern	May'13 - June'13
	- Worked on Digital Library using PHP and MySQL.	
AWARDS AND CERTIFICATES	<ul style="list-style-type: none"> • Prime Minister's Research Fellowship (Dec-2020). • Nominated by the Department of CSE, IIT Kanpur for <i>Cadence Gold Medal</i> and <i>SIIC Student Innovation Award</i> for MS thesis. • First prize in Data structure & algorithm based event <i>CODATHON</i> in OJASS'13. • Third prize in Coding based event <i>CODEMANIA</i> in Ojass' 13. • Second prize in the event <i>CODESTORM</i> conducted by the Computer Society of India at NIT-Jamshedpur held in March-2012. • First prize in the event <i>LET US C</i> conducted by the Computer Society of India at NIT-Jamshedpur held in April-2011. 	
ACTIVITIES	Coordinator CODATHON @ OJASS'14	
	- Organised the flagship Data structure and Algorithms based event in OJASS - the technical fest of NIT Jamshedpur. More than 300 candidates from all over India participated in this event.	