

Nikhil D. Hegde

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RESEARCH INTERESTS

I am interested in the areas of parallel and distributed computing, and programming languages. Specifically, I am interested in developing techniques to bridge the gap between performance and ease of programming of irregular applications on heterogeneous systems.

EDUCATION

Ph.D	Electrical and Computer Engineering, Purdue University , West Lafayette, USA <i>Thesis: Distributed Execution of Recursive Irregular Applications</i> Advisor: Prof. Milind Kulkarni	5/2019 (expected)
M.Tech	Computer Science and Engineering, Indian Institute of Technology , Madras, India <i>Thesis: Mobility Management and the Role of Mobile Node in Meghadoot Architecture</i> Advisor: Prof. C. Siva Ram Murthy	2005
B.Tech	Computer Science and Engineering, B.M.S.College of Engineering , Bangalore, India	2002

POSITIONS SUMMARY

Teaching Assistant	Purdue University , West Lafayette, USA	2019 – present
Research Assistant	Purdue University , West Lafayette, USA	2017 – 2018
Summer Intern	Technology Manufacturing Group, AQS, Intel Corp. , Hillsboro, USA	2017
Research Assistant	Purdue University , West Lafayette, USA	2014 – 2017
Teaching Assistant	Purdue University , West Lafayette, USA	2013 – 2014
Senior Engineer	Mobile Communications Group, Intel India Pvt. Ltd. , Bangalore	2012 – 2013
Senior Engineer	Symbian Technology Group, Nokia India Pvt. Ltd. , Bangalore	2010 – 2012
Senior Engineer	AdsFLO India Pvt. Ltd. , Bangalore	2007 – 2010
Software Engineer – II	HPC Connectivity Group, STMicroelectronics India Pvt. Ltd. , Greater Noida	2005 – 2007
Software Engineer	Infosys Technologies Ltd. , Bangalore	2002 – 2003

PUBLICATIONS

CONFERENCES

- **Nikhil Hegde**, Qifan Chang, and Milind Kulkarni. 2019. D2P: Automatically generating distributed dynamic programming codes. Submitted.
- **Nikhil Hegde**, Jianqiao Liu, and Milind Kulkarni. 2017. SPIRIT: A Framework for Creating Distributed Recursive Tree Applications. In *Proceedings of the International Conference on Supercomputing (ICS'17)*. ACM, New York, NY, USA, Article 3, 11 pages. <https://doi.org/10.1145/3079079.3079095>
Acceptance rate: 16%.
- **Nikhil Hegde**, Jianqiao Liu, Kirshanthan Sundararajah, and Milind Kulkarni. 2017. Treelogy: A benchmark suite for tree traversals. In *2017 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)*. 227-238. <https://doi.org/10.1109/ISPASS.2017.7975294>
Acceptance rate: 30%.
- Jianqiao Liu, **Nikhil Hegde**, and Milind Kulkarni. 2016. Hybrid CPUGPU Scheduling and Execution of Tree Traversals. In *Proceedings of the 2016 International Conference on Supercomputing (ICS'16)*. ACM, New York, NY, USA, Article 2, 12 pages. <https://doi.org/10.1145/2925426.2926261>
Acceptance rate: 24%.

- K. Balaji, **N. Hegde**, B. V. Ramana, B. S. Manoj, and C. S. R. Murthy. 2005. Performance evaluation of a hybrid wireless network architecture for rural communication. In *2005 IEEE International Conference on Personal Wireless Communications, 2005. ICPWC 2005.* 212-216. <https://doi.org/10.1109/ICPWC.2005.1431334>
- **N. Hegde**, K. Balaji, B. V. Ramana, B. S. Manoj, and C. S. R. Murthy. 2005. Implementation and Performance Evaluation of a Hybrid Wireless Network Architecture for Rural Communication. In *Proceedings of the Eleventh National Conference on Communications: NCC-2005.* ISBN: 8177647350 9788177647358

TECHNICAL REPORTS

- **Nikhil Hegde**, Qifan Chang, and Milind Kulkarni. 2018. *D2P: Automatically generating distributed dynamic programming codes*. School of Electrical and Computer Engineering Technical Report TR-ECE-18-09. Purdue University, West Lafayette, IN, USA.

AWARDS AND GRANTS

- “D2P: A framework for code generation and distributed-memory parallelization of dynamic programming algorithms”. Allocation Manager (PI: Milind Kulkarni). *XSEDE Startup Grant TG-ASC170007, 11/2018 - 11/2019*
- NSF travel grant to attend ISPASS, Santa Rosa, CA. 2017
- NSF travel grant to attend IISWC, Providence, RI. 2016

TALKS AND PRESENTATIONS

- SPIRIT: A runtime system for distributed irregular tree applications
International Conference on Supercomputing (ICS), Chicago, 2017
- Treelogy: a benchmark suite for tree traversal applications
IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS), Santa Rosa, 2017
- Implementation and Performance Evaluation of a Hybrid Wireless Network Architecture for Rural Communication
National Conference on Communications (NCC), IIT Kharagpur, India, 2005

POSTERS

- SPIRIT: A runtime system for distributed irregular tree applications
Principles and Practice of Parallel Programming (PPoPP), Barcelona, 2016
- Treelogy: a benchmark suite for tree traversal applications
IEEE International Symposium on Workload Characterization (IISWC), Providence, 2016

TEACHING EXPERIENCE

Teaching Assistant	Electrical and Computer Engineering, Purdue University Introduction to Data Science (ECE29595) Introduction to ASIC Design (ECE337)	1/2019 – present 8/2013 – 5/2014
Lab Assistant	Computer Science and Engineering, Indian Institute of Technology, Madras Paradigms of Programming (CS3100) Introduction to Computer Science and Engineering (CS1300)	8/2004 – 4/2005

SOFTWARE CREATED

- SPIRIT and Treelogy - <https://bitbucket.org/plcl/treelogy>
- D2P - <https://bitbucket.org/plcl/distributeddynamicprogramming>

OTHER PROJECTS

- WaSP: Ensemble-based Warm-Starting Parameter Initialization for Training of Neural Network Models (Purdue University, Research project, 2/2016).
- A compiler for the LITTLE programming language (Purdue University, ECE573 project, 12/2013).

PROFESSIONAL EXPERIENCE

Intern	Advanced Quality Systems, MTD, Intel Corp. , Hillsboro, USA	5/2017 – 8/2017
	<ul style="list-style-type: none">• Built predictive models using machine learning techniques to accurately predict yield and quality in Intel's chip manufacturing lines	
Senior Engineer	Mobile Communications Group, Intel India Pvt. Ltd. , Bangalore	7/2012 – 8/2013
	<ul style="list-style-type: none">• <i>Development, and integration of GPS receiver software modules on cellular platform.</i> Designed and developed modules to support different positioning protocols: OTDOA, Assisted-GPS (AGPS), Network-based, and LTE Positioning Protocol.	
Senior Engineer	Nokia India Pvt. Ltd. , Bangalore	6/2010 – 6/2012
	<ul style="list-style-type: none">• <i>Creation of hardware adaptation and OS layer for GPS receiver chips used in Nokia smartphones.</i> Ported I2C driver for SMP compliance, improved Symbian OS scheduler, developed location services protocols (RRLP, RRC, SUPLV1.0) and tested for GCF and PTCRB compliance, developed modules to support Assisted-GPS and network-based positioning technologies.• <i>Creation of robust authentication methods for Mobile Device Management (DM)</i> Developed modules to support mutual-authentication of mobile device and DM server.	
Senior Engineer	AdsFLO India Pvt. Ltd. , Bangalore	10/2007 – 5/2010
	<ul style="list-style-type: none">• <i>Creation of targeted mobile advertising solutions for iOS, WinCE, Symbian based smartphones, and DVB-H based devices.</i> Supported demonstration of the product at MWC (2007 – 2009), and CES (2008 – 2009), developed Ad-scheduling algorithms to ensure fairness, optimize fill rate, and minimize Ad fatigue, developed Electronic Service Guide (ESG), and applied basic image-processing and error-correction algorithms.• <i>Recruitment for the mobile devices team</i> Conducted technical interviews and mentored new employees	
Software Engineer – II	STMicroelectronics India Pvt. Ltd. , Greater Noida	7/2005 – 10/2007
	<ul style="list-style-type: none">• <i>Design and development of link-layer software for the DVB-H receiver chip.</i> Modeled memory controller, Reed-Solomon encoder, and DVB-H traffic decoder in software. Performed link layer validation of DVB-H IP on FPGA, Implemented drivers for taped-out chip.	
Software Engineer	Infosys Technologies Ltd. , Bangalore	12/2002 – 7/2003
	<ul style="list-style-type: none">• Tested MPLS enabled network switches.	

SKILLS

Programming: C, C++, Symbian C++, Objective C, Perl, Python, Shell, OpenGL-ES, Linux Kernel, MPI, OpenMP, Pthreads, Boost Graph Libraries.

Debuggers: Lauterbach, Trace-32, Fastrace, ARM extended debugger (AXD), Multi-ICE, gdb.

Others: Spirent ULTS, Cadence SimVision, WireShark Network Traffic Analyzer, OpenSSL, JBoss, and Tomcat, LaTeX.

Versioning and Quality: Rational tool chain, SVN, CVS, Git, Bugzilla.