Nabeel Nasir

University of Virginia
151 Engineer's Way
Charlottesville, VA 22903

Tel: +1 434.466.8219
cs.virginia.edu/~nn5rh
nabeeln@virginia.edu

EDUCATION

2018 - 2024	**University of Virginia**, Charlottesville, VA	GPA: 3.68 / 4.0
	Ph. D. Candidate in Computer Science, Advisor: Prof. Bradford Campbell	
	Thesis: Untangling the Cloud from Edge Computing for IoT	
2012 - 2014	**Indian Institute of Technology (IIT) Bombay**, India	GPA: 9.46 / 10
	M. Tech. in Computer Science, Advisor: Prof. Krithi Ramamritham	
	Thesis: Smart Door: Occupancy Prediction and its Applications	
2007 - 2011	**Cochin University of Science & Technology**, India	GPA: 76.30 / 100.0
	B. Tech. in Computer Science	

HONORS AND AWARDS

- **Endowed Graduate Fellowship**, UVA Engineering, awarded for academic excellence and demonstrated scholarship, 2023.
- **Outstanding Graduate Teaching Award** by the Computer Science Department, University of Virginia, 2023.
- Nominated for the **All-University Graduate Teaching Award**, University of Virginia, 2023. Top 5% of UVA graduate teachers
- Awarded the **UVA Teaching Fellowship** by the School of Engineering and Applied Science, University of Virginia, 2023.
- **Best Presentation Award** at the **ACM SenSys/BuildSys PhD Forum**, 2021.
- Awarded **NSF Student Travel Grants** for attending **ACM/IEEE SEC**, 2022, **ACM/IEEE SEC**, 2021 and **ACM SenSys**, 2019.
- **Spot Award** at Adobe for the work on the advanced editing palette feature in Lightroom Android, 2015.
- **2nd Place** in Hack Day, annual hackathon of the Digital Imaging group at Adobe, 2015.
- **Ranked 81st** among 156,780 candidates in the **Graduate Aptitude Test in Engineering (GATE), India**, 2012. Top 1% of all students in India

TEACHING AND MENTORING EXPERIENCE

INSTRUCTOR OF RECORD

SPRING 2023	**University of Virginia**, *Instructor of Record*
	CS/ECE 4501: Wireless for the Internet of Things, *Co-Instructor* (58 undergraduate students)

- Course description: A newly-created, senior undergraduate course providing a hands-on introduction to different wireless technologies (BLE, 802.15.4, Thread, LoRa etc.), and their tradeoffs for use in IoT.
- Responsible for course design, developing labs and assignments, and giving lectures.
- Managed two TAs and closely worked with them during lab sessions, creating assignments, and grading.
- Worked extensively with UVA's Center for Teaching Excellence (CTE) for enhancing student learning:
  - Utilized c3Design, a 5-day workshop to brainstorm learning objectives, create learning-focused assessments, and design the course syllabus.
  - Used an ESP survey for guided student feedback and an in-class observation to refine my teaching.

TEACHING ASSISTANT

2020 - 2022	**University of Virginia**, *Graduate Teaching Assistant*
	Primary Responsibilities: Grading, Holding office hours, Assisting students on Slack/Discord/Piazza

- CS 4457: Computer Networks (88 undergrad students, Spring 2022)
  - Reused and improved auto grading scripts to grade programming assignments.
- CS 4740: Cloud Computing (119 undergrad students, Fall 2021)
  - Volunteered to teach a lecture on Internet of Things and Edge Computing.
- CS 4414: Operating Systems (60 undergrad students, Spring 2021)

- Responsible for setting up server infrastructure for students to work with.
- Compiled frequently asked questions during office hours in a document shared with the class.
- CS 4457: Computer Networks (50 undergrad students, Fall 2020)
  - Developed auto grading scripts for evaluating programming assignments.

2012 - 2014   **Indian Institute of Technology Bombay**, *Graduate Teaching Assistant*
Primary Responsibilities: Grading, Assisting students
- CS 308: Embedded Systems Lab (90 undergrad students, Spring 2014)
  - Appointed Head TA, managing 8 TAs for a large undergraduate lab.
- CS 684: Embedded Systems (60 grad students, Fall 2013)
  - Responsible for grading and evaluating final projects.
- CS 210: Digital Logic Design Lab (94 undergrad students, Spring 2013)
  - Responsible for setting homework questions and assisting students during labs.
- CS 101: Computer Programming Lab (120 undergrad students, Fall 2012)
  - Facilitated voluntary tutorials for non-CS students to improve their understanding of programming.

GUEST LECTURES

FALL 2023   **Wireless Networking and Thread Lab**. CS 4501/CS 6501: Smart and Healthy Buildings (28 students)

FALL 2022   **Tutorial on Temi Robot**. SYS 4582: Smart and Healthy Buildings (22 students)

FALL 2021   **Lecture on IoT and Edge Computing**. CS 4740: Cloud Computing (119 students)
Tutorial on Temi Robot. CS 6501: CPS, Testbeds, and Policy (22 students)

MENTORING AND VOLUNTEERING

- *Facilitator*, Teaching as a Graduate Student Workshop, Center for Teaching Excellence, UVA. Facilitated a 90-min discussion session on inclusive and learning-centered teaching for 14 graduate students, 2023.
- *Chaperone*, Graduate Engineering Student Council (GESC), UVA. Helping two incoming grad students adapt to life at UVA, 2023.
- *Mentor*, Charlottesville High School, Charlottesville. Currently mentoring two senior high school students on their engineering capstone project. August 2023 - present.
- *Mentor*, Computers4Kids (C4K), Charlottesville. Currently mentoring a middle school member on stop motion animation. Previously mentored three members on Python programming. July 2022 - present.
- *Volunteer*, UVA. Designed and organized a Build an Internet workshop for middle school students at C4K, 2022.
- *Mentor*, Freelance. Mentored a high school group in mobile app prototyping to present at TiE Young Entrepreneurs Global, UC Irvine, 2017.
- *Volunteer*, Smart Energy Informatics Lab, IIT Bombay. Organized a Smart Energy Hackathon at IIT Bombay and mentored 50 students on their smart energy projects, 2014.

MENTORED STUDENTS

- Viswajith Govinda Rajan (MS, Computer Engineering, UVA 2021). Pursuing a PhD in Computer Engineering at UVA.
- Li-Pang Huang (ME, Computer Science, UVA 2020). First job: Software Engineer, Prophet Models.

WORK EXPERIENCE

EnLite Research   Mumbai, India
Software Developer E3   2017 - 2018

- Designed a system to reduce HVAC energy consumption and improve user comfort in offices.
- Developed an anomaly detection daemon to identify cooling inefficiencies and sensing issues.

Adobe Systems   Bangalore, India
Member of Technical Staff II   2014 - 2016

- Worked as an Android developer for the Lightroom and Photoshop Mix mobile apps.
- Developed key modules including image sharing, advanced editing palette, and stylus support.

Publications

[1] An IoT Ecosystem for Realtime Task Scheduling using Reinforcement Learning In Progress
Nabeel Nasir, Marshall Clyburn, Md Fazlay Rabbi Masum Billah, Victor Ariel Leal Sobral, Fateme Nikseresht, Jiechao Gao, and Bradford Campbell
ACM Journal on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), 2023.

[2] Experiences Teaching a Wireless for the Internet of Things Course Cooperatively at Multiple Universities
Nabeel Nasir, Viswajith Govind Rajan, Pat Pannuto, Branden Ghena, and Bradford Campbell
Proceedings of the 55th ACM Technical Symposium on Computer Science Education (SIGCSE TS) '24, 2024.

[3] Sensing Indoor Lighting Environments and Analysing Dimension Reduction for Identification
Tushar K Routh, Nurani Saoda, Md Fazlay Rabbi Masum Billah, **Nabeel Nasir**, and Bradford Campbell
1st International Workshop on Advances in Environmental Sensing Systems for Smart Cities (EnvSys), 2023.

[4] Low Power but High Energy: The Looming Costs of Billions of Smart Devices
Wenpeng Wang, Victor Ariel Leal Sobral, Md Fazlay Rabbi Masum Billah, Nurani Saoda, **Nabeel Nasir**, and Bradford Campbell
HotCarbon: 2nd Workshop on Sustainable Computer Systems, 2023.

[5] NexusEdge: Leveraging IoT Gateways for a Decentralized Edge Computing Platform
Nabeel Nasir, Victor Ariel Leal Sobral, Li-Pang Huang, and Bradford Campbell
7th ACM/IEEE Symposium on Edge Computing (ACM/IEEE SEC), 2022.

[6] Enabling Elasticity on the Edge using Heterogeneous Gateways: Poster Abstract
Nabeel Nasir, and Bradford Campbell
19th ACM Conference on Embedded Networked Sensor Systems (ACM SenSys), 2021.

[7] Untangling the Cloud from Edge Computing for IoT: PhD Forum Abstract Best Presentation Award
Nabeel Nasir
19th ACM Conference on Embedded Networked Sensor Systems (ACM SenSys), 2021.

[8] An Architecture for Edge Computing over Underutilized Gateways: Demo Abstract
Nabeel Nasir, and Bradford Campbell
17th ACM Conference on Embedded Networked Sensor Systems. (ACM SenSys), 2019.

[9] Fusing Sensors for Occupancy Sensing in Smart Buildings
Nabeel Nasir, Kartik Palani, Amandeep Chugh, Vivek Chil Prakash, Uddhav Arote, Anand P Krishnan, Krithi Ramamritham
11th International Conference on Distributed Computing and Internet Technology (ICDCIT), 2015.

[10] Putting Smart Meters to Work: Beyond the Usual
Kartik Palani, **Nabeel Nasir**, Vivek Chil Prakash, Amandeep Chugh, Rohit Gupta, and Krithi Ramamritham
5th ACM International Conference on Future Energy Systems (ACM e-Energy), 2014.

Talks

- *Conference Presentation*, Experiences Teaching a Wireless for the Internet of Things Course Co-operatively at Multiple Universities, 55th ACM Technical Symposium on Computer Science Education (SIGCSE TS) '24, 2024, Portland, OR, March 2024.
- *Talk*, UVA Engineering's Teaching Fellowship Program (TFP) and My Co-Teaching Experience, Link Lab, UVA, March 2023.
- *Conference Presentation*, NexusEdge: Leveraging IoT Gateways for a Decentralized Edge Computing Platform, 7th ACM/IEEE Symposium on Edge Computing (ACM/IEEE SEC), Seattle, WA, December 2022.
- *Talk*, Introduction to Sorting Algorithms: A Micro-teaching Activity, Center for Teaching Excellence, UVA, October 2022.
- *PhD Forum Presentation*, Untangling the Cloud from Edge Computing for IoT, 6th ACM/IEEE Symposium on Edge Computing (ACM/IEEE SEC), San Jose, CA, December 2021.
- *PhD Forum Presentation*, Untangling the Cloud from Edge Computing for IoT, 19th ACM Conference on Embedded Networked Sensor Systems (ACM SenSys), Coimbra, Portugal, November 2021.
- *Flash Talk*, NexusEdge: Edge Computing Platform over Distributed Gateways, Link Lab Student Flash Talks, UVA, December 2020.
- *Flash Talk*, An Architecture for Edge Computing over Underutilized Gateways, 17th ACM Conference on Embedded Networked Sensor Systems (ACM SenSys), New York, November 2019.
- *Flash Talk*, Edge Computing Platform over Underutilized Gateways, Link Lab Open House, UVA, March 2019.

Service

- *Reviewer*, ACM Technical Symposium on Computer Science Education (SIGCSE TS), 2024.

Professional Development

- Certified as a Tomorrow's Professor Today, by the Center for Teaching Excellence (CTE), UVA, a professional development program to facilitate the transition from student to an academic professional. August 2022 - October 2023.
    - Completed 40+ hours of teaching-focused workshops and 10+ hours of teaching as part of the requirements.
- Participated in a 5-day Public Speaking workshop by Prof. Cady Garey (UVA Department of Drama), organized by UVA Engineering. July 2023.
- Participated in CTE's Micro-teaching Program, which helps craft and practice engaging classroom activities, October 2022.
- Attended several workshops and conferences focused on enhancing teaching and learning:
    - Free Your Mind: Intro to Implicit Bias (Sly Mata, Division for Diversity, Equity, and Inclusion, UVA), August 2023.
    - 10th Annual Innovations in Pedagogy Summit, UVA, April 2023.
        * Harnessing the Resilience Within: The Science of Biological and Behavioral Resilience through Plasticity, Sociality, and Meaning (Mays Imad, Connecticut College).
        * Incorporation of Active Learning into Two Large Introductory Lecture Courses (Mariana Teles, Erin Clabough, UVA).
        * Nature as Co-teacher: Boosting Resilience, Creativity, and Critical Thinking in Nearby Greenspaces (Carolyn Schuyler, Dorothe Bach, UVA).
    - c3Design Workshop (CTE, UVA), January 2023.
    - Reflective Teaching Statement Workshop (Adriana Streifer, UVA), September 2022.
    - Facilitating Meaningful In-Class Discussions (Emily Gravett, JMU), October 2022.
    - Introduction to Equitable and Inclusive Pedagogy (Adriana Streifer, UVA), October 2022.
    - More Effective Teaching (Lynn Mandeltort, UVA), October 2022.
    - Teaching as a Graduate Student (CTE, UVA). August 2021.

Selected Projects

NexusEdge: Distributed Middleware for Edge Gateways [code]   2021

- Allows resource constrained IoT gateways (Raspberry Pi, NVIDIA Jetson etc.) to cooperate together and execute applications without cloud support.
- Key features: Bluetooth Low Energy (BLE) auto-discovery for scaling, supports IoT device handling modules, provides device data streams over MQTT.

Temi Whiteboard Snap [code]   2021

- Allows users of our lab to remotely request the Temi Robot to navigate to a whiteboard and send a snap over Slack.
- Utilized Slack slash commands, AWS API Gateway, AWS Lambda, MQTT, and an Android app.

Hoos Nearby: Enabling User Interaction for NexusEdge Gateways [code]   2020

- Web Application enabling users to discover nearby NexusEdge gateways, deploy Node.js IoT applications and manage them.
- Supports application log streaming on MQTT over WebSockets, BLE scanning, etc.

Smart Doodle: Pattern Recognition on Android Smart Watch [code]   2018

- Developed a smart watch application to map user defined doodles on the watchface to watch actions (open app, change settings etc.) or smart home interactions.
- Used TensorFlow Lite to run a classifier locally on a constrained watch hardware.

Navigation System using Reinforcement Learning [code]   2018

- Used reinforcement learning to train an agent to navigate in a simulated environment with obstacles.
- Used QLearning for reinforcement learning and Deepmind lab for the simulated game arena.

Pocket Library: Book Organizer for Android [play store link]   2017

- Developed an Android application for easy book cataloging. 10k+ Downloads
- Handled all aspects of the work: development, testing, UI design, release engineering, content writing, App Store Optimization, and promotion.

Skills

- **Programming**: Java, Node.js, Python, Shell Scripting, Scala, C/C++/C#
- **Databases**: InfluxDB, MongoDB, SQLite, MySQL
- **Machine Learning**: TensorFlow, TensorFlow Lite, Scikit-learn, PyTorch
- **Embedded**: Arduino, Raspberry Pi, nRF52, ESP32
- **Teaching Tools**: Canvas (LMS), Gradescope, PollEverywhere, Slido, Piazza