Nitish Nagesh

Irvine, CA, USA ⋄+1 (858) 888-1526 ⋄ nnagesh1@uci.edu ⋄ linkedin.com/in/nitish-nagesh/ ⋄ github.com/nitish-nagesh

Research Interests

Applied Machine Learning, Recommendation Systems, Natural Language Processing, Knowledge Graphs.
Applications: Food, Nutrition, Wellness, Integrative Health

Education

University of California, Irvine — Irvine, CA
Ph.D. in Computer Science; GPA: 3.75/4.0 — *Sep. 2021 – Jun. 2025 (expected)*

- **Relevant coursework**: Machine Learning, Artificial Intelligence, Natural Language Processing, Information Retrieval, Algorithms and Data Structures, Computer and Communication Networks, Embedded and Ubiquitous Systems

University of California, San Diego — San Diego, CA
M.S. Study Abroad, Computer Science and Engineering; GPA: 3.73/4.0 — *Sep. 2019 – Jun. 2020*

Technical University of Munich — Munich, Germany
M.S. in Power Engineering, Dept. of Electrical and Computer Engineering; CGPA: 3.70/4.0 — *Oct. 2018 – Dec. 2020*

R.V. College of Engineering — Bengaluru, India
B.E. in Electrical and Electronics Engineering; GPA: 3.65/4.0 — *Aug. 2012 – July. 2016*

Research Experience

University of California, Irvine — Irvine, CA, USA
Researcher, Institute for Future Health, Supervisors: Prof. Ramesh Jain, Prof. Amir Rahmani, Prof. Nikil Dutt Sep. 2021 – Present

- Analyze and visualize food, sleep, physical activity, nutrition logs over 3 years to provide N-of-1 context-aware personalized food recommendations using event mining, machine learning and Tableau.
- Develop open-source World Food Atlas database to integrate multimodal food-related data across the globe.
- Design novel data collection schema on top of Googles schema in collaboration with dietitians and physicians from Stanford University to standardize food-related dataset collection.
- Develop personalized AI-driven applications to improve peoples mood through timely dietary interventions.
- **Research Output:** 2 paper publications

University of California, San Diego — San Diego, CA, USA
Researcher, System Energy Efficiency Lab, Supervisor: Prof. Tajana Rosing — *Sep. 2019 – Feb. 2021*

- Developed novel reliability-aware task allocation strategies for IoT networks using Python to reduce overall maintenance cost.
- Built a real-world IoT mesh network communicating via MQTT and Wi-Fi to measure impact of resource constraints on reliability.
- Achieved 90% accuracy while validating a reliability simulation framework for IoT networks using Python and C/C++.
- **Research Output:** Master's thesis and 2 paper publications

University of California, San Diego — San Diego, CA, USA
Independent Research, Supervisor: Prof. Dr. Pat Pannuto — *Jan. 2020 – Jun. 2020*

- Developed a remote monitoring tool to infer relationship between soil pH, soil conditions and ambient environment unlike traditional stand-alone systems
- Effectuated targeted fertilizer application by calibrating a soil pH sensor with an average accuracy of 75%
- Researched sensing techniques and machine learning approaches to measure and predict nitrate concentration in large scale deployments

- Researched collaboratively on reproducibility for cyber-physical systems and IoT with case studies while referencing machine learning.
- **Research Output:** 1 paper publication

Technical University of Munich Munich, Germany
Young Academy Scholar, Supervisor: Prof. Winfried Petry *Nov. 2018 – Mar. 2020*

- Developed *MUCTrail* - an online tool to teach young children about the scientific method in the context of climate change
- Led software development and scientific writing efforts while working in an interdisciplinary team of researchers from the Economics, Medicine, and Biology departments
- **Research Output:** Publication in project book and social media visibility

R.V. College of Engineering Bengaluru, India
Undergraduate Researcher, Supervisor: Prof. Dr. K Uma Rao *Jan. 2016 – Jun. 2016*

- Developed a real-time cloud-based diagnostic tool for detecting faults in a micro-grid using MATLAB Simulink
- Effectuated an online alert generation system based on fault criticality allowing targeted maintenance of micro-grid
- **Research Output:** Bachelor's thesis and 1 paper publication

PUBLICATIONS

- **Nitish Nagesh**, Iman Azimi, Tom Andriola, Amir M. Rahmani, Ramesh Jain. **Towards Deep Personal Lifestyle Models using Multimodal N-of-1 Data.** 29th International Conference on Multimedia Modeling, 9-12 January 2023, Bergen, Norway.
- Ali Rostami, **Nitish Nagesh**, Amir M. Rahmani, Ramesh Jain. **World Food Atlas for Food Navigation.** 7th International Workshop on Multimedia Assisted Dietary Management, 30th ACM International Conference in Multimedia (ACMM2022), Lisbon, Portugal, October 10th, 2022.
- **[2nd Best Presentation Award]**. Alex Yen, Bryse flowers, Wenshan Luo, **Nitish Nagesh**, Peter Tueller, Ryan Kastner, Pat Pannuto **"A UCSD View on Replication and Reproducibility for CPS & IoT"**, 4th Workshop on Benchmarking Cyber-Physical Systems and Internet of Things (CPS-IoTBench) 2021.
- Kazim Ergun, Xiaofan Yu, **Nitish Nagesh**, Ludmila Cherkasova, Pietro Mercati, Raid Ayoub, and Tajana Rosing. **"RelIoT: Reliability Simulator for IoT Networks."** In International Conference on Internet of Things, pp. 63-81. Springer, Cham, 2020
- Kazim Ergun, Xiaofan Yu, **Nitish Nagesh**, Ludmila Cherkasova, Pietro Mercati, Raid Ayoub, and Tajana Rosing. **"Simulating Reliability of IoT Networks with RelIoT."** In 2020 50th Annual IEEE-IFIP International Conference on Dependable Systems and Networks-Supplemental Volume (DSN-S), pp. 25-28. IEEE, 2020.
- K. Uma Rao, Akash G. Parvatikar*, S. Gokul*, **N. Nitish***, and Pramod Rao*. **"A novel fault diagnostic strategy for PV micro grid to achieve reliability centered maintenance."** In 2016 IEEE 1st International Conference on Power Electronics, Intelligent Control and Energy Systems (ICPEICES), pp. 1-4. IEEE, 2016. *equal contribution

PROFESSIONAL EXPERIENCE

Qualcomm Austin, TX
Platform Integration Engineer *Mar. 2021 – Aug. 2021*

- Developed a Python tool to parse test data from 5000+ manufacturing logs of QAIC100 AI accelerator saving 3x cycle time.
- Triaged and debugged failures in QAIC100 SDK using Linux scripting leading to a system-wide process change in the test methodology.
- Involved in setting up proprietary server platforms in the corporate research and development lab for performance tests.

General Electric, Healthcare Division Bengaluru, India
Operations Management Leadership Program (OMLP) Intern *Jun. 2015 – Jul. 2015*

- Conceptualized single piece flow in an assembly line of X-Ray devices increasing productivity by 60%
- Created a data monitoring template using Failure Mode Effect and Criticality Analysis (FMECA) tool which led to a reduction in equipment downtime by 30%
- Designed a new layout for the high voltage (HV) tanks equipment area enabling undisturbed access to personnel and allowing a smoother flow of materials

SKILLS

- **Programming:** MATLAB, Python, C, Embedded C, C++, Java, Tcl
- **Software Tools and Packages:** PyTorch, Keras, TensorFlow, Pandas, NumPy, Scikit-learn, SciPy, Simulink, Arduino IDE, Git, Vivado HLS, SQL, HTML, CSS, Dash, I2C, UART, SPI, Code Composer Studio, Matplotlib, QAIC100 SDK
- **Hardware:** Oscilloscope, Logic Analyzers, JTAG, Arduino, Raspberry Pi, NodeMCU, PYNQ-Z2
- **Languages:** English (Native/Bilingual proficiency), German (Limited working proficiency), Spanish (Elementary Proficiency), Telugu (Native/Bilingual proficiency), Kannada (Native/Bilingual proficiency), Hindi (Limited working proficiency), Tamil (Elementary proficiency)

PROJECTS

Natural Language Processing Implementation Irvine, CA
Course Project: Natural Language Processing , Supervisor: Prof. Dr. Sameer Singh *Apr. 2022 – Jun. 2022*

- Classified presidential candidate speeches via supervised and semi-supervised learning in Python/TensorFlow.
- Built n-gram language models on the Brown, Gutenberg and Reuters corpuses. Analyzed in-domain and out-of-domain perplexities to compare language models and individual sentences.
- Developed a part-of-speech (POS) and named entity recognition (NER) tagger for twitter data using Conditional Random Fields (CRF) and incorporated Viterbi algorithm to improve CRF accuracy.
- Implemented top-K sampling, nucleus sampling, beam search decoding algorithms and evaluated summarization models qualitatively and quantitatively using Python/TensorFlow.

Slot Descriptions in Self-Attentive Dialogue State Tracking (DST) Irvine, CA
Course Project: Natural Language Processing , Supervisor: Prof. Dr. Sameer Singh *Apr. 2022 – Jun. 2022*

- Implemented full-shot and zero-shot dialogue state tracking on MultiWoz 2.1 dataset with 5 domains and 8438 dialogues using Python/TensorFlow to transfer knowledge from resource rich domains to unknown domains
- Deployed BERT base model and evaluated accuracy for inserting slot descriptions in zero-shot and full-shot DST

Web Crawler and Search Engine Builder Irvine, CA
Course Project: Information Retrieval, Supervisor: Prof. Pramit Choudhary *Jan. 2022 – Mar. 2022*

- Crawled 50,000 URLs from ics.uci.edu domain using Python to find page similarity and subdomains
- Built search engine using Flask, HTML, CSS to query and retrieve top twenty matches from crawled databases

Fashion MNIST Classification using Covolutional Neural Networks Irvine, CA
Course Project: Machine Learning , Supervisor: Prof. Dr. Roy Fox *Sep. 2021 – Dec. 2021*

- Classified fashion-MNIST dataset running convolutional neural networks (CNN) on Google Colab using Python
- Achieved 95.88% training accuracy and 93% test accuracy after hyperparameter tuning and cross-validation

Reinforcement Learning and Machine Learning Algorithm Design Irvine, CA
Course Project: Artificial Intelligence, Supervisor: Prof. Dr. Roy Fox *Sep. 2021 – Dec. 2021*

- Programmed reinforcement learning agent using Monte Carlo Tree Search in Python to solve Sokoban puzzle
- Designed and implemented machine learning algorithms using kNN, Naïve Bayes classifiers, linear regression, cross-validation, logistic regression, shattering, nearest neighbor, decision trees, neural networks, and clustering

Interactive global energy consumption dashboard San Diego, CA
Lab Project: Renewable and Sustainable Energy, Supervisor: Prof. Dr. Thomas Hamacher *Apr. 2020 – July. 2020*

- Developed first-of-its-kind energy parameter visualization platform for 200+ countries using Dash
- Deployed scalable and globally accessible website using Heroku sourcing data from a structured SQL database using SQLite
- Actualized user-friendly interface for parameters with customizable checkboxes and predictions using logistic regression in Python

Algorithm design and benchmarking for FPGA San Diego, CA
Course Project: Validation and Testing of Embedded Systems, Supervisor: Prof. Dr. Ryan Kastner *Jan. 2020 – Mar. 2020*

- Achieved average 85% throughput for FIR filter, DFT, FFT using Vivado High Level Synthesis (HLS)
- Added a new benchmark to Spector HLS, a benchmark suite for FPGA by implementing canonized Huffman Encoding in C++
- Optimized design space with 15% higher throughput range and 60% greater pareto points compared to baseline

Real-time soil environment monitor with pest deterrence San Diego, CA
Course Project: Introduction to Embedded Computing, Supervisor: Prof. Dr. Tajana Rosing *Jan. 2020 – Mar. 2020*

- Outperformed traditional sensing techniques with remote soil sensing and active real-time pest deterrence using Linux, C/C++
- Introduced predictive capabilities within 10% sensing range based on linear regression using the Scikit-learn library in Python
- Visualized soil vitals on an interactive online dashboard developed using HTML, CSS, Flask, and JavaScript

Contactless trash weight estimator San Diego, CA
Course Project: Embedded Computing and Communication, Supervisor: Prof. Dr. Aaron Schulman *Sep. 2019 – Dec. 2019*

- Attained 70% accuracy in determining an unknown amount of grocery waste using C/C++ and principles of RF attenuation
- Observed less than 25% standard deviation during prototype testing using received signal strength indicator (RSSI) metric
- Realized hands-off food waste estimation without modifying existing trash bin structure by simple retrofitted add-ons

Real-time wireless ambient temperature sensing Munich, Germany
Lab Project: Sensor Node, Supervisor: Prof. Dr. Markus Becherer *Jun. 2019 – Aug. 2019*

- Developed wireless temperature sensing framework using a resistance temperature detector (RTD) sensor with less than 0.2 variation between sensed and actual values
- Achieved 20% less external noise interference using a Sallen-Key low-pass filter in read-out circuit built using PSoC creator
- Executed real-time secure communication with less than 5% latency using C/C++ with data encapsulation and visualization

MENTORING

ANTrepreneur Center Graduate Venture Consultant Fellow Irvine, CA
University of California, Irvine *Sep. 2022 – Present*

- Assist Director with ANTrepreneur Center programming, research and assessment, and student venture consultations.
- Host regular consultations with students and student venture teams, mentor undergraduate entrepreneurs, host startup training on the UCI campus and collaborate on research projects.
- Create and facilitate in-class presentations and special topic workshops, draft handouts and represent the Center at campus events.

Graduate Interconnect (GIC) Peer Mentor Irvine, CA
University of California, Irvine *Jun. 2022 – Present*

- Assist staff at the International Center in helping incoming graduate students to transition smoothly into their graduate program

Lead Mentor, Artificial Intelligence Club Irvine, CA
University of California, Irvine *Sep. 2021 – Present*

- Designed and executed a 10-week long comprehensive coding interview preparation program over the summer to help prepare students for software engineering and machine learning internships and jobs in the industry
- Lead weekly paper discussion sessions on seminal and trending topics in AI/ML/Data Science
- Conduct workshops related to graduate school, research process, and finding on-campus and off-campus research positions

Undergrad Research Mentor San Diego, CA
University of California, San Diego *Jan. 2020 – Mar. 2020*

- Interacted biweekly with rising undergraduate junior introducing my research, busting myths about research, explaining research projects in the lab, and pointing student toward resources for undergraduate research.
- Motivated student to carry out research that led him to pursue research assistant and undergrad researcher positions during his senior year

Buddy for Practical Research Experience Program (PREP) Students Munich, Germany
Technical University of Munich *May. 2019 – Aug. 2019*

- Assisted undergraduate student from UC Berkeley in overcoming logistical and cultural challenges while in Munich.

Mentor for International Exchange Student Munich, Germany
Technical University of Munich *May. 2019 – Aug. 2019*

- Supported junior undergraduate student from National Chiao Tung University, Taiwan with specific questions related to the Electrical and Computer Engineering Program

TEACHING

Teaching Assistant Irvine, CA
University of California Irvine *Sep. 2021 – Present*

- Tutor and mentor 200+ students in the upper division course *Critical Writing on Information Technology*
- Critically evaluate and provide constructive feedback on student's elevator pitches, technical resumes, presentations and reports empowering them to excel in corporate and academic roles.

LEADERSHIP

Student Representative, Diverse Educational Community and Doctoral Experience Irvine, CA
Department of Computer Science, University of California Irvine *Sep. 2021 – Present*

Member, Torrey Pines Toastmasters Club San Diego, CA
University of California San Diego *Oct. 2019 – Present*

Finance Lead, U2Q (University to Qualcomm) Board Austin, TX
Qualcomm *May. 2021 - Aug. 2021*

Secretary, Torrey Pines Toastmasters Club San Diego, CA
University of California San Diego *Jun. 2020 – Dec. 2020*

Member, Association of Indian Graduate Students (AIGS) San Diego, CA
University of California San Diego *Sep. 2019 – Jun. 2020*

Organizer, Young Academy Science Hackathon Munich, Germany
Technical University of Munich *Dec. 2020*

HONORS AND AWARDS

Student Travel Grant US$2,000 for ACM Multimedia Conference 2022 — Lisbon, Portugal
ACM SIGMM (Associated Computing Machinery Special Interest Group in Multimedia) — *Aug. 2022*

Entrepreneurial and Technical Lead, Wayfinder UC-affiliated Start-up Incubator — Irvine, CA
University of California Irvine Beall Applied Innovation — *Jun. 2022 – Present*

Mental Health Hackathon Winner US$3,500 (1 of 30) — Irvine, CA
University of California Irvine ANTrepreneur Center and Sigma Computing — *May. 2022*

Elevator Pitch Competition Winner US$100 (2nd out of 10) — Irvine, CA
Graduate Professional Success for PhD students and Postdocs in STEM, University of California Irvine — *Dec. 2021*

University of California Grad Slam Semi Finalist (1 of 40) for 3-min research pitch — Irvine, CA
University of California Irvine — *Feb. 2022*

Graduate Student Fellowship US$2,500 (1 of 350) for academic excellence and future promise — Irvine, CA
Graduate Division, University of California Irvine — *Sep. 2021*

Richard Newton Young Fellow Grant (1 of 80) — San Diego, CA
57th Design Automation Conference (DAC) (Remote) — *Jun. 2020*

International Student Scholarship US$2,500 (1 of 200) for academic excellence — Munich, Germany
Government of Bavaria and Technical University of Munich — *Nov. 2019 – Dec. 2020*

Masters Thesis Scholarship US$2,000 (1 of 50) for writing masters thesis abroad — Munich, Germany
German Academic Exchange Service (DAAD) and Technical University of Munich — *Nov. 2020 – Feb. 2021*

Young Academy Scholarship (1 of 40) for passion towards science — Munich, Germany
Government of Bavaria and Technical University of Munich — *Nov. 2018 – Dec. 2020*

Most Innovative Thesis Award (2nd in 70) for entrepreneurship excellence — Bengaluru, India
R.V. College of Engineering — *Jul. 2016*

Academic Excellence Award (2nd in 70) for highest overall GPA — Bengaluru, India
R.V. College of Engineering — *Aug. 2012 – Jul. 2016*

Best Outgoing Student (1st in 70) for all round excellence — Bengaluru, India
R.V. College of Engineering — *Aug. 2012 – Jul. 2016*

INVITED TALKS

Towards Building Personalized Food and Wellness Recommendation Systems — Paris, France
Host – Prof. Lionel Bretillon, INRAE - National Research Institute for Agriculture, Food and the Environment — *Oct. 2022*

Youth Action Assembly - Regional Roundtables for Asia, Pacific and North America — Rome, Italy
World Food Forum, United Nations Food and Agricultural Organization (UN FAO) — *Oct. 2022*

Building Personalized Food and Wellness Recommendation Systems — Barcelona, Spain
Host – Prof. Petia Radeva, University of Barcelona — *Oct. 2022*

World Food Atlas for Food Navigation — Lisbon, Portugal
7th International Workshop on Multimedia Assisted Dietary Management — *Oct. 2022*

SERVICE

Reviewer — Bergen, Norway
29th International Conference on Multimedia Modeling — *Jan. 2023*

Volunteer — Lisbon, Portgual
30th ACM International Conference on Multimedia — *Oct. 2022*

Volunteer — Bengaluru, India
SMVA Trust, NGO — *Aug. 2016 – Sep. 2018*

- Actively engaged in "Feeding the Hungry" project for 20 hours/month where my team and I distributed freshly cooked meals to 10+ orphanages and senior centers to alleviate poverty and hunger
- Organized personal hygiene awareness campaigns for impoverished youth toward long-term health.
- Involved in visiting villages, distributing clothes, environmental stewardship, and offering humanitarian assistance during natural calamities

CERTIFICATES

Public Speaking Certificate Program — Irvine, CA
Activate to Captivate, University of California Irvine — *Aug. 2022*

Mentoring Excellence Program — Irvine, CA
University of California Irvine — *May. 2022*

Mini Law School — Boulder, CO
University of Colorado Boulder — *Oct. 2020*

Micro MBA, Rady School of Management — San Diego, CA
University of California San Diego — *Aug. 2020*

REFERENCES

Dr. Amir Rahmani	**Dr. Nikil Dutt**	**Dr. Ramesh Jain**	**Dr. David Ochi**	**Tom Andriola**
Associate Professor	Professor	Professor	Professor	Vice Chancellor, IT and Data
UC Irvine	UC Irvine	UC Irvine	UC Irvine	UC Irvine
Ph.D. Advisor	*Ph.D. Advisor*	*Ph.D. Advisor*	*Innovation Advisor*	*Research Collaborator*
a.rahmani@uci.edu	dutt@uci.edu	jain@ics.uci.edu	dochi@uci.edu	tom.andriola@uci.edu