Gokul Hariharan,

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Summary

I would like to experience being a formal methods / machine learning developer at the forefront of engineering and technology. I have been involved in various collaborative software projects in the fields of runtime verification, formal methods, computational fluid dynamics, ANN, and linear algebra. I am dexterous in various programming languages, including Python, C++, and Javascript to name a few.

Experience

Research Assistant
Iowa State University — Jan 2021 - Present (10 months +)
~ Runtime verification for safety critical systems.

Postdoctoral Researcher
University of Southern California — Apr 2020 – Dec 2020 (9 months)
~ Advanced Control theory and machine learning to control flow transition in channel flows

Research Assistant
University of Minnesota — Jan 2016 - Apr 2020 (4 years 4 months)
~ Carried out direct numerical simulations by creating codes in C++
~ Used Matlab, Mathematica, Python, for analytical, numerical and statistical analysis of results

Teaching Assistant
University of Minnesota — Jan 2019 - May 2019 (5 months), Sep 2018 - Dec 2018 (4 months)
~Held discussions and proctored exams for two graduate-level courses, Linear Algebra and Fluid Mechanics.

Research Assistant
Indian Institute of Technology, Delhi — Jan 2014 - Jun 2015 (1 year 6 months)
~ Simulated the influence of ash on coal particles during fluidization using Discrete Element Modeling (DEM).
~ Tracked coal and ash movements using Molecular-Dynamics-like Simulations (MDS) using C++
~ Leveraged Computational Fluid Dynamics (CFD) in C
~ Won the best poster award in Open House – 2015, IIT Delhi

Research Intern
BITS Pilani, Hyderabad Campus — May 2011 - Jun 2011 (2 months)
~ Optimal solution between two conflicting objectives in job scheduling using ANN
~ Used ANN to predict flow stress in the dynamic strain aging regime of austenitic stainless steel 316

Education

Iowa State University
Doctor of Philosophy (Ph.D.), Computer Science | GPA: 4.0 — 2021 - 2023

University of Minnesota
Doctor of Philosophy (Ph.D.), Chemical Engineering | GPA: 3.5. — 2015 - 2020
Specialization in Fluid Mechanics. The dissertation consists of four projects:
-- Analyzed effects of localized point forces disturbances in viscoelastic channel flow (Matlab)
-- Spectral methods for (input-output) nonmodal analysis of Newtonian and viscoelastic channel flows (C++, Matlab, and Mathematica)

-- Stress amplification in inertialess viscoelastic channel flows
-- Direct numerical simulations (DNS) using new and advanced spectral methods (C++, Matlab, Python)

Indian Institute of Technology, Delhi
Master of Technology (M.Tech.), Chemical Engineering | GPA: 3.8 2013 - 2015

National Institute of Technology Warangal
Bachelor of Technology (B.Tech.), Chemical Engineering | GPA: 3.8 2009 - 2013

Honors & Awards

F Wendell Miller Scholarship – Department of Computer Science, Iowa State University, Jan 2021
CEMS Outstanding TA Award - CEMS, University of Minnesota, Jun 2019
Sebastian C. Reyes Fellowship - CEMS, University of Minnesota Jan 2016
Stephan J. Salter Fellowship - CEMS, University of Minnesota Jan 2016
Certificate of Excellence - Chemical Engineering Society, IIT Delhi, 2015 Department rank 1 (of 25)
Best Research Poster Award, Open House 2015 - Indian Institute of Technology Delhi 2015
Roll of Honor Gold Medal - National Institute of Technology Warangal, 2013, Department rank 1 (of 100)

Expertise

C++ (11) • Python • Javascript • Mathematica • Matlab • Git • OpenMP • MPI • ANN • Machine Learning • Research • Formal Methods • Runtime Verification • Data Structures and Algorithms • Finite Element Method • Computational Fluid Dynamics (CFD) • Decision-Making • Creative Problem Solving • Attention to Detail • Scientific Writing • Linear Systems Theory • Nonlinear Analysis • Applied Mathematics • Modeling and Simulation • Parallel Programing • Thermal Engineering • Teaching

Papers and Presentations

Please visit https://gokulhari.github.io/webpage/Papers.html