PONSUGANTH ILANGOVAN

Technical Specialist, Researcher

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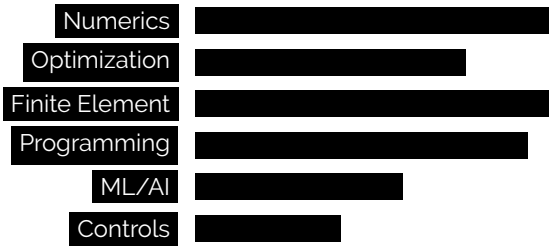
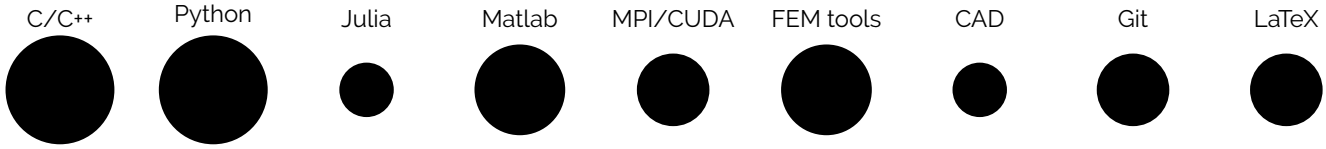
WHO AM I?

I would consider myself a technophile and have been known to not give up on things that excite the mind. My goal is to keep contributing impactfully to the technologically rich society that we are in today. With my experience and education, I have been exposed to CAD and FEM simulations, numerics, programming, HPC, real-time systems and a bit of ML/AI.





EDUCATION

2018 – 2020 **Master's Degree – Computational and Data Science** — **Indian Institute of Science (IISc), Bangalore, India**
GPA – 8.20/10

2014 – 2018 **Bachelor's Degree – Mechanical Engineering** — **SSN College of Engineering – Anna University, Chennai, India**
GPA – 8.36/10

2012 – 2014 **High School** — **SBIOA Model Matric Higher Secondary, Chennai, India**
Passed with overall 94%

EXPERIENCE

2020 – Present **Technical Specialist** — **Bosch India – Research and Technology Centre**
Worked with an international team of researchers, solving problems related to numerical methods and solutions of ODEs in single precision embedded hardware for real-time systems, worked on the implementation of ODE solvers, Kalman filters, online optimizers and related algorithms, parameter tuning in ODE systems and also exposed to hybrid modelling methods such as PINNs, Neural ODEs, etc.
`C / Python / Matlab / Julia / Git`

2018 – 2020 **Graduate Research Assistant** — **Indian Institute of Science (IISc)**
Worked on developing a patient-specific computational model of the human cornea and estimating parameters with experimental or synthetic data with which the modelled patient-specific cornea behavior can be determined and can be relates to illness
`C/C++ / Python / FEM tools / Linux`

May to July 2019 **Data Science Intern** — **Reliance Industries Limited**
Worked with a team of experts on machine learning and performed sentence classification with state-of-the-art algorithms and also built a dashboard for hosting and data collection
`Python`

March 2018 **Design Validation Intern** — **Valkan Engineering**
Worked with structural designs relating to the placement of solar panels and analyzed the same by applying wind loads from CFD simulations
`CAD / Ansys`

December 2016 **Project Intern** — **Steinbeis Solar Research Center**
Worked on developing a CAD model of an underwater remote-operated vehicle for prototyping
`CAD / Ansys`

ACADEMIC PROJECTS

Quantification of Biomechanical Properties of Human Cornea with Finite Element Method **Master's Dissertation**
Patient-specific finite element model of the cornea was developed with open source FEM tools, both static and dynamic models were implemented, surface geometry was created using Zernike polynomials fitted to the cornea, material parameters of the finite element model were recovered from measurement data (synthetic), the goal is to use measurements from air puff test to identify material behavior of cornea and in turn, study the illness associated with patients
`C/C++` / (2020)

Discontinuous Galerkin Method for 1D Advection **Course Project**
Analyzed the use of discontinuous Galerkin method for the first order wave equation, created a 1D FEM library with linear and higher order elements, assembly routines and iterative linear algebraic solver routines. `https://github.com/suganth1997/fem-project`
`C/C++` / (2019)

GPU parallelization of cost function evaluations in global optimizers **Hobby Project**
Cost function evaluation of the population in each generation of the global optimizer algorithm – differential evolution in scipy was modified and adapted to be offloaded to GPU with CUDA routines and a speed up with large populations was achieved.
`https://github.com/suganth1997/scipy/tree/master/examples/cuda`
`C` / `Python` / (2022)

Finite Element Analysis of Tool Wear in Machining of Hastelloy **Bachelor's Project**
Analysis of tool wear in the machining of Hastelloy material, microscopic images were taken and compared to finite element results, appropriate parameters were also tuned manually to get a better fit with the experiments
`Deform 3D` / (2018)

Numerical Study of Blade Profiles of Vertical Axis Wind Turbine with Bi-directional Wind Flow **Bachelor's CFD Project**
CFD simulation of wind flow around a VAWT was performed and the starting of the turbine from rest was studied, assuming continuous bidirectional wind flow, the rpm progression with time until stabilization was also extracted
`Ansys Fluent` / (2017)

Cricket match simulation with decision tree classifier **Hobby Project**
With the ball by ball dataset, a decision tree classifier model was trained with certain features, and the model was used to create a simulation with a simple Tkinter interface where at each ball, the model was used for predictions. `https://github.com/suganth1997/ipl-machine-learning`
`Python` / (2018)

PUBLICATIONS AND PATENTS

Improving the Stability of Kalman Filters with Posit arithmetic
Ponsuganth Ilangovan P, Rohan Rayan, Vinay Shankar Saxena
Submitted – Conference on Next Generation Arithmetic (CoNGA) 2023

Numerical Study of Blade Profiles of Vertical Axis Wind Turbine (VAWT) with Bidirectional Wind Flow in Highway Roads
Arun Prakash, P. Ponsuganth Ilangovan, Nitin Joy, R. Subramanian – Advances in Energy Research, Vol. 2, Springer, `https://link.springer.com/chapter/10.1007/978-981-15-2662-6_33`

Cutting forces and tool wear studies on machining of Hastelloy X
K.S. Vijay Sekar, K. Gobivel, G. Ram Goutham, P. Ponsuganth Elangovan, N. Naresh Babu – Materials Today: Proceedings, Volume 62, Part 2, 2022, Pages 852-857, `https://doi.org/10.1016/j.matpr.2022.04.049`

An Electronic Control Unit (ECU) for solving ordinary differential equations and a method thereof
Reference – IN202241037263A – To be updated in patbase

A Kalman Filtering Method and Filter Device
Reference – IN202041052051A

MOOC COURSES

Geometric Algorithms
Coursera – EIT Digital (2022)

Finite Element Method for Problems in Physics
Coursera – University of Michigan (2017)

Matlab Programming for Numerical computations
NPTEL – IIT Madras (2017)

HOBBY

Video editing, Cricket, Video games, Motorcycling, Hobby coding, Reading, Arduino and Raspberry pi, Creating Math videos