Saurabh Verma

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Education:

University of Florida — Gainesville
Master of Science (M.S) in Computer Science — expected May 2021

Indian Institute of Information Technology, Design and Manufacturing, Jabalpur — Jabalpur, India
Bachelor of Technology, Mechanical Engineering, GPA: 7.2/10 — 2011-2015

Technical Skills:

Languages : C++, C, Python, C#, MATLAB
Web : Amazon Web Services, Javascript, flask
Libraries : scikit-learn, pandas, numpy, jupyter, TensorFlow, Three.js, ARCore
IDEs and VC : Visual Studio, Android Studio, TFS, Git

Work Experience:

Center for Computational Technologies (CCTech), Pune, India
Senior Member of Technical Staff — *June 2015 - July 2019*

- Full time software developer at CCTech, a company working in the CAD/CAE space.
- Worked on developing various backend services of *simulationHub*, a cloud based CFD software.
- Contributed to feature development of part-cloud/part-desktop application Autodesk Fusion 360 as part of a virtual team.
- Lead the CCTech R&D team to deliver various internal research projects (see https://experiments.cctech.co.in/) at the intersection of Engineering Design, Computational Geometry and Machine Learning.

Projects:

Machine Learning based Control Valve Design

- An experimental web application (https://experiments.simulationhub.com/valve-design) to predict flow performance of mechanical control valves in real-time using Machine Learning.
- Lead a team of three developers on tasks such as collecting raw data through multiple CFD simulations, analysis and preparation to generate the training dataset, training of ML models such as Gaussian Processes and Neural Networks and finally development of front-end and back-end components of the web application.
- Technologies used : python(with libraries such as jupyter, pandas, numpy, scikit-learn, tensorflow), Amazon Web Services(EC2, lambda and S3), Autodesk Forge Platform

ML Mesh Segmentation

- An experimental, web based machine learning application (https://experiments.cctech.co.in/ml-mesh-seg/) that segments triangle meshes into different surface patches of different surface types (cone, plane, sphere, torus, cylinder, b-spline).
- Lead a team of three developers on tasks such as collection of raw data, analysis, feature engineering, training of ML models using deep neural networks and finally development of front-end and back-end components of the web application.
- Technologies used : python(with libraries such as jupyter, pandas, numpy, tensorflow scikit-learn), Amazon Web Services(EC2, lambda and S3), Autodesk Forge Platform

Events Detection on Time-series Driving Data

- A web application to automatically discover and display speed breaker and pothole locations in Pune city. Collected time-indexed driving data from multiple 4-wheeled vehicles using On-Board Diagnostic(OBD) device. Experimented with the data using several machine learning algorithms such as AdaBoost, LSTM etc to detect speed-breaker and pothole events in the driving data.
- Technologies used : python(with libraries such as scikit-learn, tensorflow, pandas, flask), Amazon Web Services, Google Maps API

Feature Recognition on Triangle Meshes

- Developed algorithms for segmentation of triangle meshes using heuristic and pattern based techniques. The algorithms can segment and recognise simple shapes such as cylinder, sphere, torus, cone etc. using surface fitting techniques which can subsequently be used to classify various mechanical features for applications in reverse-engineering
- Technologies used: *C++*

Fusion Drawings Development

- Developed features for the *Fusion Drawings* workspace of part-cloud/part desktop application *Autodesk Fusion360.* Features developed were - Tables, Text Justification and Alignment, Dimension Break, Dimension offset, Dimension Group Stretch and others.
- Participated in 6 weeks long hands-on knowledge transfer sessions at Autodesk Singapore development centre at initial stage of project.
- Technologies used : C++

simulationHub - A cloud-based CFD product (https://www.simulationhub.com/)

- Contributed to several projects as part of the backend engineering team. Developed services for CAD geometry processing, data extraction and cleaning. Improved robustness of simulation results via contributions to *Fluid Volume Extraction Service* and *Auto-Meshing Service.*
- Developed micro web-services for communication between server components.
- Technologies used: C++, python, C#, javascript, PHP, Amazon Web Services

Incremental Sheet Forming

(*Senior Year Research Internship Project, IIITDM Jabalpur* *May - Nov 2014*

- Project sponsored by the Department *of Atomic Energy*, India.
- As part of a research group, developed a program to generate coordinates of 3D curves from triangle meshes. These coordinates are sent as inputs in the form of NC codes to a special CNC milling machine for manufacturing sheet metal parts.
- Implemented several geometry algorithms, such as mesh slicing with cutting planes, polygon offset, binary space partition tree etc.
- *Technologies used: C++*

Patents and Publications:

P. Tandon, S. Priyadarshi, S. Verma, P. K. Jain, M. K. Samal, J. J. Roy, D. Roy, A process and System for Manufacturing of Formed Sheets and/or Components thereof with Offset Contours.
Published, 06/02/2017. Indian Patent: 201721006539 A

S. Priyadarshi, S. Verma, P. Tandon, Development Of Thickness Prediction Strategy In Incremental Forming For Improvement In Part Evaluation. Twelfth International Symposium on Tools and Methods of Competitive Engineering (TMCE 2018)

Vaibhav J Hase, Yogesh J Bhalerao, Saurabh Verma, G.J.Vikhe Patil "Intelligent Systems for Volumetric Feature Recognition from CAD Mesh Models". Accepted, International Journal of Intelligent Enterprise

Vaibhav J Hase, Yogesh J Bhalerao, Saurabh Verma, Vishnu D. Wakshaure, "Automatic Interacting Hole Suppression from CAD Mesh Models". Accepted, ICCET-2019, Advances in Intelligent Systems and Computing

Achievements:

- Received 500 USD reward from Autodesk for submitting my app- *Vox-O-Matic* to the Autodesk App Store during the *Fusion 360 Hackathon* from September - October 2016
- Came in 2nd place in the *simulationhub hackathon* conducted at CCTech for implementing my idea on *CFD simulation results visualization in Augmented Reality*
- Came in 1st place in the company wide blogathon for my blog titled - Recognizing *Geometric Shapes in 2D space using Machine Learning*.

Extra-Curriculars:

- Conducted a small workshop on deep learning at CCTech, as an initiation exercise for employees into this field.
- Conducted information sessions at CCTech, on topics such as Geometric Modelling and Machine Learning, for the benefit of employees.
- Taught mathematics to underprivileged children between ages of 8 -14 years from surrounding villages of my college, IIITDM Jabalpur, as part of JAGRITI - a social initiative by students.