

Mohit Gupta

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EDUCATION

Doctor of Philosophy in Civil & Environmental Engineering

Aug 2021 - Present

Arizona State University, United States Advisor: Dr. [Thomas Czerniawski](#)

M.Tech. in Design Engineering (GPA: 9.62/10)

Aug 2019 - May 2021

Birla Institute of Technology and Science (BITS) Pilani, India

B.E.(Hons.) in Civil Engineering (GPA: 9.19/10)

Aug 2011 - May 2015

BITS Pilani, India

PROFESSIONAL AND RESEARCH EXPERIENCE

AI Intern, Swiss Federal Institute of Technology Lausanne, Switzerland

July 2022 - Aug 2022

LIPID Lab Advisor: [Prof. Marilyne Anderson](#)

- Trained a Long Short-Term Memory (LSTM) network with Resnet-50 backbone to predict discomfort from facial videos recorded in varying luminance conditions.
- Utilized domain knowledge for increasing performance by concatenating the cell state of LSTM with scene-based parameters and facial action units.

Research intern, Technical University of Munich, Germany

May 2022 - June 2022

Chair of Computational Modeling and Simulation, Advisor: Prof. [Andre Borrmann](#)

- Performed a comparative study between NeRF and Colmap for 3D reconstruction of indoor scenes.

Senior Engineer, THDC India Limited, India

Oct 2018 - July 2021

- Analysed spatio-temporal rainfall data to predict flood and check the suitability of 3 different catchments for constructing a new hydraulic dam. Also, managed the maintenance of chutes and dam galleries.

BIM Engineer, Vconstruct Private Limited, India

May 2015 - July 2016

- Team Lead for the Structural modelling; developed Revit workflows and interfaced with clients, defining the scope of work and deliverables' schedule.

RESEARCH PROJECTS & HACKATHON

Semi-supervised symbols detection in Piping and Instrumentation Drawings

(Pytorch)

- Developed a Siamese Network for symbol retrieval and applied K-means coreset sampling to achieve nearly the same performance as using the full dataset, but with only 30% of the data.
- Improved the Top-1 accuracy by 4.5% with Ensemble learning

Automated 2D building plans to 3D digital model

(Pytorch, Dynamo)

- Trained a Yolov3 model to recognize building components in 2D CAD. Then, linked the localised coordinates with Dynamo to create 3D model in Revit.

Valve detection in P&IDs without human annotations: A synthetic data approach

(Tensorflow)

- Devised a synthetic-data generation pipeline to create a labelled dataset without any human annotations. Presence of a look-alike symbols (i.e. hard negatives) reduced false positives & increased the performance.

Kaggle DFL Bundesliga Data Shootout

(Pytorch)

- Implemented an LSTM network achieving 76% accuracy to recognize different types of soccer passes in Football tournament videos.

Polyp Segmentation in the Colonoscopy videos

(Python, OpenCV, Pytorch)

- Developed a 2-stage method for polyps detection. Stage-1 examines the video frame quality, and; Stage-2 localises polyps using a U-Net architecture.

PUBLICATIONS

- **M. Gupta**, T. Czerniawski, Semi-supervised symbol detection in Piping & Instrumentation drawings, Automation in Construction, 2023 (In review).
- **M. Gupta**, A. Borrmann, T. Czerniawski, NeRF vs Colmap for 3D Reconstruction: A Comparative Study, ASCE International Conference on Computing in Civil Engineering 2023, Oregon, United States (Abstract accepted)
- **M. Gupta**, C. Wei, T. Czerniawski, Automated valve detection in Piping & Instrumentation drawings, ISARC 2022.
- C. Wei, **M. Gupta**, T. Czerniawski, Automated wall detection in 2D CAD drawings to create digital 3D models, ISARC 2022.

ACADEMIC ACHIEVEMENTS

- Rank-1 in the graduate program (out of 120 students).
- All India Rank of 88 out of 153,000+ applicants in GATE 2018, India's most competitive engineering exam with 13% passing rate.
- Recipient of Merit Scholarship in the undergraduate degree program for being in top 1%.

LEADERSHIP EXPERIENCE

- Captain, Table Tennis team at THDCIL, won Bronze medal (3rd place) in Inter-PSU Table tennis Tournament, 2019.
- Joint coordinator of APOGEE 2013 (BITS Technical Festival), organized one of four kernel events.
- Project Leader at Nirmaan (100+ members), an NGO working to improve education standards in impoverished communities of India.

SKILLS

Languages	Python, Matlab, C
Tools and Frameworks	PyTorch, Tensorflow, Keras, Git
3D Modelling	Autodesk-Revit, AutoCAD, Navisworks, Sketchup