# Mohit Gupta

mgupta70@asu.edu | (480) 764 0822 | LinkedIn | Google Scholar

## 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 *May 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. The model achieved an accuracy of 86%.

**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.(Team size-5 , Projects led-8)

## 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.

## 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 |