ZEAL SHAH

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EDUCATION

University of Massachusetts Amherst — Amherst, MA
Ph.D. in Electrical & Computer Engineering, GPA:3.93/4.00 — Aug 2018 - May 2023 *(Expected)*

Carnegie Mellon University — Pittsburgh, PA
M.S. in Energy Science, Technology & Policy, GPA:3.78/4.00 — Aug 2016 - Dec 2017

Pandit Deendayal Energy University — Gandhinagar, India
B.S. in Electrical Engineering — Jun 2012 - Jun 2016

COMPUTING SKILLS

Programming languages: Python, SQL, Matlab | **ML stack:** Numpy, Pandas, PyTorch, Scikit-learn | **GCP tools:** Compute Engine, BigQuery, Bucket, Earth Engine | **Meta's data tools:** Dataswarm (Airflow), Presto | **Others:** Git, Slurm, QGIS, Grafana

EXPERIENCE

University of Massachusetts Amherst — Amherst, MA
Graduate Research Assistant — Aug 2018 - Present

- Generate world's first set of outage maps for 320 African cities and 3,000+ USA counties, by developing a machine learning (ML) pipeline to infer power outages in 12 million satellite images.
- Achieved 3x improvement on state-of-the-art for remote sensing-based power outage detection in Accra, Ghana, through application of ML on satellite data.
- Created a pipeline using Python to acquire and process 25TB+ of geospatial data on a high-performance computing cluster, supporting 4 in-house research initiatives.
- Quantified electrification in 9 million satellite images spanning Kenya for Rockefeller Foundation's energy studies, using convolutional neural networks in PyTorch. (*Top* 3 *papers at NeurIPS'21 ML4D workshop*)
- Developed a novel image data acquisition and processing solution for low-income utilities to measure electricity quality using off-the-shelf cameras. (*Best paper nominee at ACM BuildSys'19*)
- Guided 6 research projects (1 graduate, 4 undergraduate, and 1 high-school) focused on data-driven power grid monitoring.

Meta Reality Labs (Meta RL) — Burlingame, CA
Data Engineering Intern (RL Privacy) — May 2022 - Aug 2022

- Improved engineering workflow and eliminated scripting redundancies by building data pipelines to generate a dynamic data inventory of all RL telemetry events.
- Collaborated with software engineers to enhance inventory data quality, and partnered with compliance experts to streamline privacy policy tracking using the inventory.
- Enhanced accessibility and usability of event data for stakeholders by designing inventory-powered metrics and dashboards.
- Analyzed data using Presto, Daiquery and SQL, and created/managed pipelines using Python and Dataswarm (Airflow).

Atlas AI — Palo Alto, CA
AI Engineering Intern (Remote) — May 2020 - Aug 2020

- Produced monthly electrification maps of Africa (2012-20) to help clients locate potential investment sites, by building a satellite data processing pipeline and training an ML model.
- Assisted with development of a remote sensing-based energy demand classifier to deliver localized insights into a region's energy consumption levels.
- Acquired data using Google Earth Engine, trained ML models using Python on Google Compute Engine, and stored results in Google Bucket and BigQuery.

SparkMeter — Washington, DC
Data Science Intern — Feb 2018 - Sep 2018, May 2017 - Aug 2017

- Analyzed data from 10,000+ smart meters and generated analytical reports using Python, to provide clients with actionable insights into their microgrid operations.
- Improved issue detection and resolution time by creating Grafana dashboards to track the health of deployed systems in real-time.
- Provided adhoc data analytics support to engineering, product and customer success teams.

PUBLICATIONS

Machine Learning and Data Pipelines

- **Z. Shah** et al. "*The inequitable distribution of power interruptions during the 2021 Texas winter storm Uri.*" Under review.
- **Z. Shah** et al. "*The Electricity Scene from Above: Exploring Power Grid Inconsistencies Using Satellite Data in Accra, Ghana.*" Elsevier Applied Energy 2022.
- S. Correa, **Z. Shah** et al. "*PowerScour: tracking electrified settlements using satellite data.*" ACM BuildSys'22.
- S. Correa, **Z. Shah** et al. "*This Little Light of Mine: Electricity Access Mapping Using Night-Time Light Data.*" ACM e-Energy'21. (Short paper)

Neural Networks and Data Pipelines

- **Z. Shah** et al. "*A Higher Purpose: Measuring Electricity Access Using High-Resolution Daytime Satellite Imagery.*" ML4D workshop at NeurIPS'21. **Ranked among top 3 papers.**

Data Analytics

- **Z. Shah** et al. "*Mapping Disasters & Tracking Recovery in Conflict Zones Using Nighttime Lights.*" IEEE GHTC'20.

Image Data Acquisition and Processing

- **Z. Shah** et al. "*GridInSight: Monitoring Electricity Using Visible Lights.*" ACM BuildSys'19. **Best paper nominee**.
- A. Yen, **Z. Shah** et al. "*EffiSenseSee: towards classifying light bulb types and energy efficiency with camera-based sensing.*" ACM BuildSys'22.