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)*
Honors: Dean's Fellowship recipient (2018-19)
Leadership: Supervised 2 graduate, 4 undergraduate and 1 high-school research projects.

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

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

COMPUTING SKILLS

Programming: Python, SQL, Matlab; **Storage:** PostgreSQL; **Geo-spatial tools:** Google Earth Engine, QGIS; **Big data tools (Google):** BigQuery, Bucket, Compute Engine; **Big data tools (Meta):** Presto, Dataswarm (Airflow); **Others:** Slurm, Grafana

EXPERIENCE

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

- Building a novel ML solution to infer power grid outages from nightlight satellite imagery of the US at a daily cadence. Employing transfer learning to produce the first ever high-resolution outage maps for 800 African cities.
- Developed an in-house pipeline for acquiring and processing large volumes of satellite data; it supports seamless integration with infrastructure and demographics datasets to facilitate lab's research on monitoring built environment at scale.
- Built a Python-based tool that leverages satellite imagery to quantify the energy justice implications of power outages in disaster-stricken areas. Resulted in 2 publications.
- Trained ML models to identify power outages in satellite imagery of Accra, Ghana, to demonstrate the feasibility of remote-sensing data for low-cost grid monitoring in developing regions. Resulted in 1 peer-reviewed publication.
- Employed convolutional neural nets to estimate the extent and type of electrification in 9 million satellite images spanning Kenya. Selected among top 3 papers at ML4D workshop at NeurIPS'21.
- Engineered vision-based data acquisition and processing techniques to measure electric grid voltage, frequency and phase using digital cameras. Best paper nominee at ACM BuildSys'19.

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

- Built pipelines to create a dynamic event inventory – an automatically updating source of truth for all RL events and related metadata – to facilitate consistent cataloging and discovery of RL telemetry events.
- Collaborated with RL compliance and legal teams to include event-level privacy metadata in the dynamic inventory for streamlining the assignment, propagation and compliance tracking of privacy policies.
- Led the collaboration with engineers from different RL teams to enhance the inventory, and setup customized data alerts.
- Analyzed RL-wide telemetry datasets using Presto and Daiquery; created, scheduled and monitored pipelines using Python and Dataswarm (Airflow); visualized data using Unidash.

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

- Developed a satellite data processing pipeline and an ML model to produce monthly electrification data layers for the entire African continent from 2012-20 – a locational intelligence product offered by Atlas AI.
- Assisted with building strategies to help clients identify sites for new infrastructure projects, and locating their target customers using the electrification and other in-house data layers.
- Explored and ingested satellite data using Google Earth Engine, trained and evaluated the ML models using Python on Google Compute Engine, and stored the results in Google Bucket and BigQuery.

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

- Designed and built smart meter data intelligence reports using Python and SQL to periodically deliver actionable insights into technical and commercial operations of 68 customer grids.
- Created dashboards using Grafana and SQL for real-time monitoring of deployed metering systems, to help improve team's response time.

SELECTED PUBLICATIONS

- **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.*" Applied Energy 2022.
- A. Yen, **Z. Shah** et al. "*EffiSenseSee: towards classifying light bulb types and energy efficiency with camera-based sensing.*" ACM BuildSys'22.
- S. Correa, **Z. Shah** et al. "*PowerScour: tracking electrified settlements using satellite data.*" ACM BuildSys'22.
- **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.**
- 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)
- **Z. Shah** et al. "*Mapping Disasters & Tracking Recovery in Conflict Zones Using Nighttime Lights.*" IEEE GHTC'20.
- **Z. Shah** et al. "*GridInSight: Monitoring Electricity Using Visible Lights.*" ACM BuildSys'19. **Best paper nominee**.