Ali Mousavi, Ph.D.

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Profile

Professional passionate to work with people.Holistic and synergetic solution-oriented view to human and engineering systems. Team player, strongly self-motivated, positive thinker with a track record of working with people, reliability, and diligence.

- +8 years of experience with a broad and diverse experience portfolio that revolves around process engineer, data analytic, and human and resource management.
- Experienced engineer and data scientist with a solid background in both analytical and hands-on experience.
- Especially in energy conversion & storage, surface sciences, data analytic, and system optimization.
- Sharp problem solving abilities. Proven track record of building systems from research to production.
- **Release-quality delivery in fast-paced stakeholder timelines**.

Technical skills

DATA ANALYTIC and STATISTICAL
SQL | Spark | Python | MATLAB | Minitab.

INDUSTRY KNOWLEDGE
Experimental Design (Factorial design,*t*-test) | Lab Management | People Management (also preparing for PMP certificate), Technoeconomial analysis (battery systems).

ENGINEERING SOFTWARE
COMSOL (chemical reaction modeling) | LabVIEW (CERTIFIED BY NI). Familiar with: FEA | CAD

MATERIAL CHARACTERIZATION
SEM (JEOL,Hitachi) (**over 2000** images and EDX scans, nominated two time in NNCI national competitions for most stunning image) | X-ray Diffraction (XRD) (Bruker) | Goniometer (Ramehart) | Glove Box | Physical vapor deposition (PVD on silicon wafer) | MaskAligner Profilometry (power spectrum analysis) | Gas chromatography (GC-TCD, FID) | ICP-MS

ELECTROCHEMISTRY
EIS (test and circuit modeling) | Cyclic voltammetry (**CV, ORR test**) | Corrosion (**Tafel analysis**, PDP & LP tests), Rotating disk (**RDE**, Levich Study), Conductivity measurement, **Battery manufacturing & testing** (coin cell, packs, and flow batteries).

Work experience

Senior Machine Learning Engineer, Enovation Analytics | Aug. 2022 – Oct. 2025

- Led **Machine Learning Operations** framework design:**CI/CD**, automated model retraining, / performance monitoring
- Developed ML models in **ERCOT ISO (electric market)** supported delivery timelines for stakeholders such as BlackRock. **Load forecasting, wind and solar** short term prediction.
- **ETL** for AI-driven real-time price forecast. Achieved **13% KPI improvement**; **35% profit increase** vs. prior baseline.
- **Built 10+ database pipelines** (ingestion, cleaning, QC, storage); **3**× gain in data access& team efficiency.
- Deployed **interactive dashboards and web applications** for non-technical stakeholders; adopted by management.
- Shipped reusable **Python modular packages** that standardized workflows and accelerated integration across teams.
- **Cloud** resource management and orchestration; reduced cloud spend and operational overhead.

Data Scientist, Center for Tire Intelligence, Intelligent Fiber Optic Systems (IFOS) | Aug. 2020 – Aug. 2022

- Real-time **anomaly detection** for an ultrasonic metal 3D printer.
- Features from telematic **1.3 MHz** accelerometer streams (time and time–frequency domains).
- Wavelet analysis + **CNNs** for a **signal classifier**; baselines included Numenta, KNN-CAD.
- Physics-informed models + ML; reduced fabrication and maintenance costs up to **42%**.

Tools: Python | MATLAB | CNN | statsmodel | Spark | Scipy | WebApps | SQL | Docker | Git | GCP/AWS | Airflow

Researcher, Advance Material and Technology Laboratory (Virginia Tech University) | Jan. 2018 – Aug. 2021

- Managed the experimental design and setup for conducted experiments involving metallic superhydrophobic and liquid infused non wetting surfaces.
- Designed taguchi robust experiment designs to test how to improve manufacturing processes.
- Over 200 pages of quarterly report written to the Department of Energy (DOE) and evaluated by the Funding agency.
- Reducing levelized cost ($) of condenser by factor of 2.5 for a 550 MW coal-fired power plant.
- Data engineering and machine learning for prediction of corrosion rate. Application of concentrated solar power (CSP) generation.

Research Assistant, Sustainable Energy Laboratory (ICTAS, VTech University) | Jan. 2017 – Jan. 2018

- MEMs design and fabrication of micro-impedance sensors (PVD gold on Silicon, lithography, HF etching, etc.) for smart biopsy tool application.
- Electrochemical characterization (oxygen reduction) by thin film Rotating disk electrode (RDE)
- Electrospinning PAN matt, oxidized and carbonized as GDL for Fuel Cell
- Designed and built a gold four-electrode setup for electrical conductivity measurement of PAN matt.

Research Assistant, Battery and Energy Storage Research Laboratory (VTech) | Aug. 2016 – Aug. 2017

- Li-ion battery: coin cell and pouch cell assembly and disassembly, cycle test
- Flow battery: Intermediate temperature sodium sulfur (Na -S) flow battery cell assembly and test (electrode material preparation and analysis, SEM, RAMAN, etc.)
- Air battery: cell assembly and test setup design.
- Techno-economical analysis of flow battery system.

Lab Management Experience (VTech) | Aug. 2016 – 2017

- Setup a whole new inbox pouch cell manufacturing line (including, dies, calendaring, cutters, stacker, ultrasonic welding, etc.) | New Glove Box setup, maintenance, and regeneration (MBraun®, Inert®) | Safety management.

Mentorship, Mechanical engineering senior design (VTech) | Sep. 2017 – Dec. 2017

- Mentor students for "Virginia Tech Recreational Electric Vehicle"
- Mentored student on battery packs testing (Samsung 18650 and A123 Prismatic) over costume current profile (with 220 Amp max current) and record temperature data from the batteries during cycles at two different conditions (natural and forced convection)

Research Assistant, Hawai'i Natural Energy Institute (HNEI) | Jan. 2013 – Dec. 2015

- Experimental designed based on 2K factorial design, CCD and response surface analysis method for analytical tests on the performance of plasma reactor for reforming hydrocarbons and biofuels to hydrogen rich gas.
- Analyze Gas Chromatography data. And COMSOL reaction simulation

Technical expert, Engineer, Oil & Gas Wellhead Facilities, Energy & Sazeh Co. | Jan. 2010 – Jan. 2013

- Hired as the technical expert to consult with Oil & Gas Wellhead Facilities on energy matters.
- Wrote and presented procurement plans with the government and third -party companies.
- Shadowed the technical parts purchasing process to provide efficiency suggestions.

Education and Qualification

Ph.D., Mechanical Engineering — Virginia Tech; GPA 3.90/4.0 — Oct. 2021
Data Science Fellowship — The Data Incubator (admitted within top 2% of applicants) — Spring 2020
M.S., Mechanical Engineering — University of Hawaii at Mānoa; GPA 3.96/4.0 — Dec. 2015
B.S., Mechanical Engineering — Sharif University of Technology; GPA 3.56/4.0 — May 2012

Summer School Excellence — Chiemsee, Germany; CEA (France) / TUM (Germany) Summer 2016
"On the future of common European energy strategy - Electro mobility & Energy conversion"
* Excellent verbal and communication skills; author of several scientific articles. Google Scholar.

Selected Publications (Google scholar)

- S.M.Ali **Mousavi**., and R. Pitchumani. "Temperature-dependent Dynamic Fouling on Superhydrophobic and Slippery Nonwetting Copper Surfaces" **Chemical Engineering Journal** (Impact factor 13.2) Read more
- S.M.Ali **Mousavi**., and R. Pitchumani. "A Study of Corrosion on Electrodeposited Superhydrophobic Copper Surfaces." **Corrosion Science** (Impact factor 7.2) Read more
- S.M.Ali **Mousavi***, Fengchang Yang*, et.al. "Sodium-Sulfur Flow Battery for Low-Cost Electrical Storage" **Advanced Energy Materials** (Impact factor 25.3) Read more
- S.M.Ali **Mousavi**., William Piavis, and Scott Turn. "Reforming of biogas using a non-thermal, gliding-arc, plasma in reverse vortex flow and fate of hydrogen sulfide contaminants." Fuel Processing Technology (Impact factor 5.0) Read more