Mihir Kalvakaalva

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EDUCATION

Texas A&M University, College Station, Texas, United States — Major GPA: 4.00/4.00
B.S. Materials Science and Engineering, Minor in Mathematics — Exp. Graduation: May 2026

SKILLS

Instrumentation: XRD, SEM, Raman Spectroscopy, EDS, HPLC, GC-MS, FT-IR, ICP-OES
Techniques: ALD, CVD, Laser etching, Design of experiment, Glove box operation, Wet chemistry
Computer Skills: Python, MS Office, Autodesk Fusion 360, CAD

RESEARCH APPOINTMENTS

Student Researcher — Aug. 2024 - Present
Banerjee Group, Department of Chemistry, Texas A&M University
- Conducting solid-state synthesis of transition metal oxides and topochemical ion insertion for electrodes.
- Conducting SILAR-based synthesis of quantum dot heterostructures for photocatalysis.
- Employing spectroscopy to characterize compositional and phase purity of synthesized materials.
- Refining and analyzing experimental XRD data to determine crystal structure and physical characteristics.
- Presenting experimental results in team meetings and assisting collaborators with research efforts.

Materials Scientist Intern — Jun. 2024 - Aug. 2024
Xerion Advanced Battery Corp.
- Developed solution-based, ALD, and CVD coating methods for the prevention of chemical evolution and mechanical failure in high voltage cycling of Li-ion cathodes. Improved cathode capacity retention by 133%.
- Synthesized lithium cobalt oxide cathodes for pouch cells and coin cells via a molten salt flux deposition.
- Conducted testing and analysis of calendering and processing methods to increase electrode flexibility.
- Designed Python programs to evaluate dQ/dV, differential pulse voltammetry, and capacity retention.
- Employed XRD, SEM, Raman spectra, EDS, FT-IR, and ICP-OES for characterization of electrode material.

Research Project Lead — Dec. 2023 - May. 2024
Holtzapple Group, Department of Chemical Engineering, Texas A&M University
- Supervised and managed a research team of 25 undergraduate students to design and commercialize novel vapor compression desalination methods and liquid elutriation systems for efficient mineral separation.
- Modeled and approved 3D models through CAD and Blender for accurate system specifications.
- Managed a limited project budget for three sub-teams to achieve a working elutriation prototype and 2nd place recognition in Texas A&M Student Research Week.

Undergraduate Research Assistant — Sep. 2023 - May. 2024
Holtzapple Group, Department of Chemical Engineering, Texas A&M University
- Regulated and measured over 80 samples with GC-MS and HPLC to determine trends in biofuel viability.
- Designed and implemented batch-wise bioreactor method for variable pH and large-scale processes.

AWARDS AND HONORS

Texas Entrepreneurship for Energy Exchange Fellowship — May. 2024 - Present
Texas A&M Student Research Week: 2nd Place Poster Presentation — Mar. 2024
The Congressional Award: Gold Medal — Jul. 2022
Texas A&M Engineering Honors — Aug. 2022 - Jan. 2024

TEACHING EXPERIENCE

Materials Science Tutor — Jan. 2025 - Present
Department of Materials Science and Engineering, Texas A&M University
- Teaching and tutoring coursework including Thermodynamics (MSEN 210), Soft Matter (MSEN 250), Structures of Materials (MSEN 260), and Introduction to Materials Science (MSEN 201).

- Conducting regular review sessions and test prep sessions for undergraduate materials science students.
- Reinforcing knowledge of essential concepts and improving personal teaching capabilities.

CONTRIBUTED POSTERS AND PRESENTATIONS

Texas A&M Student Research Week 2024 — Mar. 2024
Texas A&M Spring Engineering Showcase 2024 — Apr. 2024

LEADERSHIP AND SERVICE

Science Chair — Jun. 2024 - Present
Society of Asian Scientists and Engineers
- Collaborating with the Texas A&M Chapter executive board to implement science initiatives.
- Facilitating communication between industry professionals and research-minded organizations.

Collegiate Committee — Jan. 2023 - Jun. 2024
Society of Asian Scientists and Engineers
- Organized monthly professional development events through communication with industry sponsors.
- Facilitated volunteering and team-building opportunities to improve member retention.

AFFILIATIONS

Member, ASM International — Aug. 2024 - Present
Member, The Electrochemical Society — Jun. 2024 - Present
Science Chair, Society of Asian Scientists and Engineers — Jan. 2023 - Present
Member, American Institute of Chemical Engineers — Jan. 2023 - Aug. 2024
Member, Texas A&M Honors Student Council — Aug. 2022 - Jan. 2024