

Unmesh Tokale

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EDUCATION

B.S. Chemical Engineering (Expected May 2029)

University of Texas at Austin

RESEARCH

Wang Materials Group

Researcher

Aug 2025 – Present

- Applying Density Functional Theory (DFT) software such as Abinit on the supercomputer Lone Star 6 to simulate how doping materials such as AlN and GaN can increase their non-linear coefficients.
- Developing alloy- and superlattice-based solutions for quantum transduction.
- Aiming to allow communication between quantum computers without requiring near-absolute zero temperatures.

Crystalline Materials for Energy and Sustainability Group

Researcher

Nov 2025 – Present

- Experimenting with surface chemistry for metal oxides in next-generation Zn-MnO₂ batteries.
- Applying advanced laboratory techniques, including electrochemical deposition and X-ray diffraction (XRD).
- Testing various carbon substrates, such as carbon cloth and graphite, to determine their effects on coulombic efficiency, cycling stability, and rate capacity.

EXPERIENCE

BayChemical Engineering Competition

Lead Organizer

June 2024 – Oct 2024

- Founded the first major online high school chemical engineering competition.
- Garnered 60 participants from 10 countries; secured \$1,000+ in sponsorships.
- Ran the competition, advertised, and wrote a majority of the exam, including the creative solution portion.

Longhorn Rocketry Association

Design Engineer

January 2026 – Present

- Part of the Advanced Research: Controls team to simulate algorithms.
- Using Simulink and MATLAB to develop better algorithms for airbakes on a high-power rocket.

IEEE Power and Energy Society

Environmental Engineer

Aug 2025 – Present

- Designing a self-sustaining mini-greenhouse that conjoins fish and plants into a closed, interdependent system.
- Implementing waterproof circuitry to track the greenhouse's self-sustaining system.

ATX Science Olympiad

Exam Writer & Event Organizer

Aug 2025 – Present

- Wrote Materials Science Exam over advanced topics for a competition with over 1000 participants from around the state and nation. Advanced topics include the Hall-Petch Effect, CVD, and semiconductors.
- Planned and carried out the lab and examination efficiently, and led a team to administer the exam to over eighty students successfully.

Yuwa

Intern

May 2023 – Aug 2023

- Mastered project management and process engineering through lectures and application of taught topics.
- Applied project management tools to coordinate mock engineering projects in team settings, strengthening leadership and technical communication.

SKILLS & CERTIFICATIONS

Programming Languages: Python, MATLAB, Java, JavaScript, LaTeX, TypeScript

Software: Arduino, Simulink, Abinit, PWTk, Quantum Espresso, Ubuntu, Fedora, VSCode

Certifications: Certiport Java IT Specialist, IAEA Environmental Remediation Certification

Languages: English, Marathi, Spanish