Andrew Nelson Tunell

(214) 846-6990
AUSTIN, TX
tunellandrew@gmail.com

LinkedIn
Google Scholar

SUMMARY

I am a Ph.D candidate in Mechanical Engineering with an expected graduation in Summer 2026. My research focuses on adhesion and fluid interactions on nanostructured surfaces. Through NASA sponsorships, I have developed dust mitigating surface structures through the study of Van der Waal, electrostatic, and capillary forces at the nanoscale. Through teaching, conference presentations, and startup pitch competitions, I have refined my communication skills and excel at conveying complex topics to diverse audiences. I am a fast learner with a wide array of skills developed through personal interests and broad involvement in diverse professional research projects.

EDUCATION

Ph.D. Mechanical Engineering (Manufacturing and Design) *University of Texas at Austin*
GPA 3.89/4.00 *2021-Present*

B.S. Mechanical Engineering (Entrepreneurship Minor) *University of Texas at Austin*
GPA 3.38/4.00 *2017-2021*

EXPERIENCE

Graduate Research Assistant *2021 Fall - present*
Nanostructures and Nanomanufacturing Laboratory | Prof. Chih-Hao Chang
Walker Department of Mechanical Engineering, University of Texas at Austin

Investigation of nanoscale adhesion and dust mitigating nanostructures

- Leading graduate researcher for a NASA Early-Stage Innovation (ESI24) grant, "Engineering the Adhesion Mechanisms of Hierarchical Dust-Mitigating Nanostructures"
- Contributed to NASA Small Business Innovation Research (SBIR) Phase I & II grants with Smart Material Solutions LLC, "Passive Nano-and Micro-Textured Dust-Mitigation Surfaces in Space-Grade Materials Made with a Highly Scalable Fabrication Process"
- Published novel qualitative and analytical models for approximating electrostatic forces on nanostructured surfaces through investigations in electrostatic interactions due to surface geometry and conductivity with experiments and COMSOL simulations.
- Developed dust-mitigating nanostructured surfaces that demonstrated a 93% reduction in residual dust contamination compared to a planar reference in standard atmospheric conditions.
- Developed and fabricated hierarchical surface geometry through PDMS molding, atomic layer deposition (ALD), and physical vapor deposition (PVD) and demonstrated reduced surface adhesion due to decreased Van der Waals forces.
- Wrote multiple grant proposals for agencies, including NSF and NASA, to secure research funding.
- Worked with manufacturers and managed procurement of specialized research equipment for a newly established research lab at the University of Texas.
- Gave biweekly presentations to collaborators within the university, setting the agenda and goals. Delivered quarterly reports, both written and presentations, to NASA collaborations to share research updates and gather feedback.

Nanoparticle identification in periodic nanostructures

- Developed novel methodologies to identify nanoparticle density and dispersion patterns on periodic nanostructures using optical and fluorescent microscopy.
- Developed detection methods for identifying particle contaminants on periodic nanostructures in scanning electron microscope (SEM) images using Fourier transforms and image processing techniques.

- Fabricated superhydrophilic periodic nanostructures on silicon substrates using interference lithography and modeled fluid diffusion rates of resulting surfaces with a <2.5% deviation from experimental values.

Program Director *April 2025 - present*
Gogentic AI | Prof. Ira Greenberg
Gogentic AI (creative and educational AI consulting with ties to Southern Methodist University), Dallas, Texas
- Oversaw the integration of creative AI features such as dynamic asset generation for multiple clients.
- Responsible for fine-tuning of generative AI models using LoRA training to meet client specific needs, including replicating existing art or conversational styles.
- Established, configured, and operated production environments for the organization using industry standard technologies such as Docker, Proxmox hypervisor, Prometheus and Grafana monitoring, and virtual machine deployments.
- Led biweekly meetings involving setting project goals and agendas, leading instructional workshops on upcoming AI tools, and hosting guest lecturers.
- Conducted 50+ interviews; hired and managed 12 employees with specialties in computer science.

Graduate Teaching Assistant *2021 Fall & 2022 Spring*
Mechatronics Lab (ME 140L) | Dr. Thomas Connolly
Walker Department of Mechanical Engineering, University of Texas at Austin
- Prepared lab sessions and graded project reports for approximately 60 junior mechanical engineering students per semester.
- Led classes in experiments involving electrical circuit components and measurement equipment such as oscilloscopes, capacitors, diodes, transistors, DC/AC motors, and photoresistors.

SKILLS

Software:
Python | COMSOL | MATLAB | Arduino | Linux CLI | Autodesk Inventor | SolidWorks | Microsoft Office Suite | Adobe Photoshop | Google Suite | Docker | Proxmox | Kubernetes | Prometheus | Grafana

Laboratory Training:
Scanning Electron Microscopy (SEM) | Low Voltage SEM | ESEM | EDX | AFM | Confocal Microscope | PVD | ALD | Lloyd's Mirror Lithography | Contact Angle Goniometer | Spin Coating | Roll-to-Roll Nanocoining | Clean Room Training | Laser Safety | Machine Shop Certification

Relevant Coursework:
Analytics and Controls for Semiconductor Manufacturing | Optical Engineering | Optics and Lasers | Nanoscale Energy Transport | High Throughput Nanopatterning

OTHER ACTIVITIES

Linux Server Management *2022 - Present*
Configured a Proxmox hypervisor on a Linux based home server to deploy virtual machines.
Hosted services for AI model training and hosted several personal websites.

Senate Messenger *2021 Feb – 2021 May*
Employee of Texas Senate
Deliver messages around Texas Capitol and assist with Senate Committee meetings during the 2021 legislative session.

Founder Ant Hill Pottery *2016 - 2020*
Founded and managed a ceramics business.
Create, advertise, and sell ceramic vases.
Manage a self-hosted website and ship orders.

Boy Scouts of America *2015*
Eagle Scout
Planned a community service project in which I led a group of younger scouts to build a portable storage area for Mi Escuelita Preschool in Dallas, Tx