AMBER MILLER

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EDUCATION

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN　　　　　　　　　　　　GRADUATION: DECEMBER 2025
The Grainger College of Engineering　　　　　　　　　　　　　　　　　Major: **Aerospace Engineering**

WORK EXPERIENCE

IMEG CORP., BOSTON, MA　　　　　　　　　　　　JUNE 2024-AUGUST 2024/JUNE 2025-AUGUST 2025
MECHANICAL ENGINEER INTERN
- Coordinated and designed HVAC layouts using Revit, collaborated with architects, plumbing, fire protection, civil, and electrical. Performed site inspections to verify compliance with specifications and construction documents.
- Collaborated with various manufacturers to source and size AHUs, Pumps, Boilers, and Condensers.
- Created custom software to expedite/partially automate pressure drop and fluid volume calcs.

SUMMIT DESIGN + BUILD LLC, CHICAGO, IL　　　　　　　　MAY 2022-AUGUST 2022/MAY 2023-AUGUST 2023
INTERN, ESTIMATING ASSISTANT (2023), LABORER (2022)
ASSISTED WITH BUDGETING, BID COLLECTION, AND CONSTRUCTION DOCUMENT MANAGEMENT FOR COMMERCIAL BUILDS.
- Performed estimates and takeoffs; supported scheduling, submittals, and change order tracking.
- Created a custom python script for automation of summary sheets combining old estimated data.
- Performed manual labor at construction sites.

PROJECTS

AUTONOMOUS CAT TOY ROBOT (PERSONAL PROJECT)　　　　　　　　　　　　MARCH 2025-PRESENT
- Starting from scratch, utilized a Raspberry Pi Zero W 2, alongside some servos, a usb camera, a Lidar sensor, some laser diodes, and a 3D printed chassis designed with NX to create an autonomous mobile robot cat toy.
- Created a custom gstreamer video pipeline connected to a Cloudflare tunnel to a personally designed flask website to allow ultra-low latency, real time control of the servos, lasers, and camera.
- Utilized lidar sensor to build 3D point-cloud of apartment for later object detection algorithm with the plan to incorporate the known location of objects into the autonomous play feature so the laser knows to avoid furniture and stick to flat ground.

CUSTOM CAD SOFTWARE FOR THE AUTOMATION OF PRESSURE DROP AND FLUID VOLUME CALCS　　JUNE 2025-AUGUST 2025
- Coded custom software which can read a large pdf file, containing construction blueprints, and quickly calculate the various fluid volume and pressure drops from different piping sources across many floors and sections of building.
- Can quickly export the data to a readable excel sheet with the stored information displayed neatly and summarized across floors and the whole building.
- Packaged the software in an .exe and created a custom gui for an easy and intuitive user interface with many of the same features as Bluebeam Revu with some additional custom features tailored towards piping and ventilation.

AIAA UNDERGRADUATE AIRCRAFT DESIGN COMPETITION 2025, UNIVERSITY OF ILLINOIS CHAMPAIGN URBANA　JANUARY 2025-MAY 2025
DISCIPLINES: STABILITY & CONTROL AND COST ANALYSIS | AE 443 AEROSPACE SYSTEMS DESIGN
- Designed and analyzed tail sizing, control surfaces, static/dynamic stability, and trim characteristics for supersonic UAV using AVL, Raymer, and Roskam methods.
- Performed aircraft stability margin scissor diagram analysis and tail sizing trade studies to minimize trim drag while staying within static margin constraints using custom python scripts along with data and collaboration with Mass Props and Aero.
- Collaborated with performance, mass properties, and aerodynamics to iterate design to meet mission and RFP specs.
- Conducted operations, flyaway, RDT&E, and life cycle cost analysis using modified DAPCA IV and Roskam models adjusted for use of advanced manufacturing materials such as titanium and composites, and performed material cost trade study to ensure flyaway unit cost stayed under $25M while maximizing the aircraft's titanium usage to meet turn rate and load limit requirements.

AUTONOMOUS DRONE FOR LASER LIGHT SHOW | AE 483 AUTONOMOUS SYSTEMS　　　　　AUGUST 2024-DECEMBER 2024
- Utilized Crazyflie open source software and recommended hardware to program an extremely accurate control/observer system for the drone.
- Built custom software using Pygame and a Bezier curve module to allow a user to hand draw a trajectory for the drone and convert it into dynamically feasible flight instructions, ensuring smooth and stable flight while maintaining incredible accuracy to the original hand drawn trajectory and minimizing jerk.

LYAPUNOV STABILITY ANALYSIS OF PDE SYSTEMS | AE 454 DYNAMICAL SYSTEMS AND CONTROLS　　APRIL 2025-MAY 2025
- Constructed a robust Lyapunov functional proof in infinite dimensions for PDE systems such as the damped wave and heat equations testing with various boundary conditions such as Robin, Neumann, Dirichlet, and Periodic, to evaluate the system's Lyapunov stability. Confirmed results using backwards Euler numerical method to simulate the 2D heat and damped wave equation.