

COLLEGE OF ENGINEERING

**R&D**

**Expo**

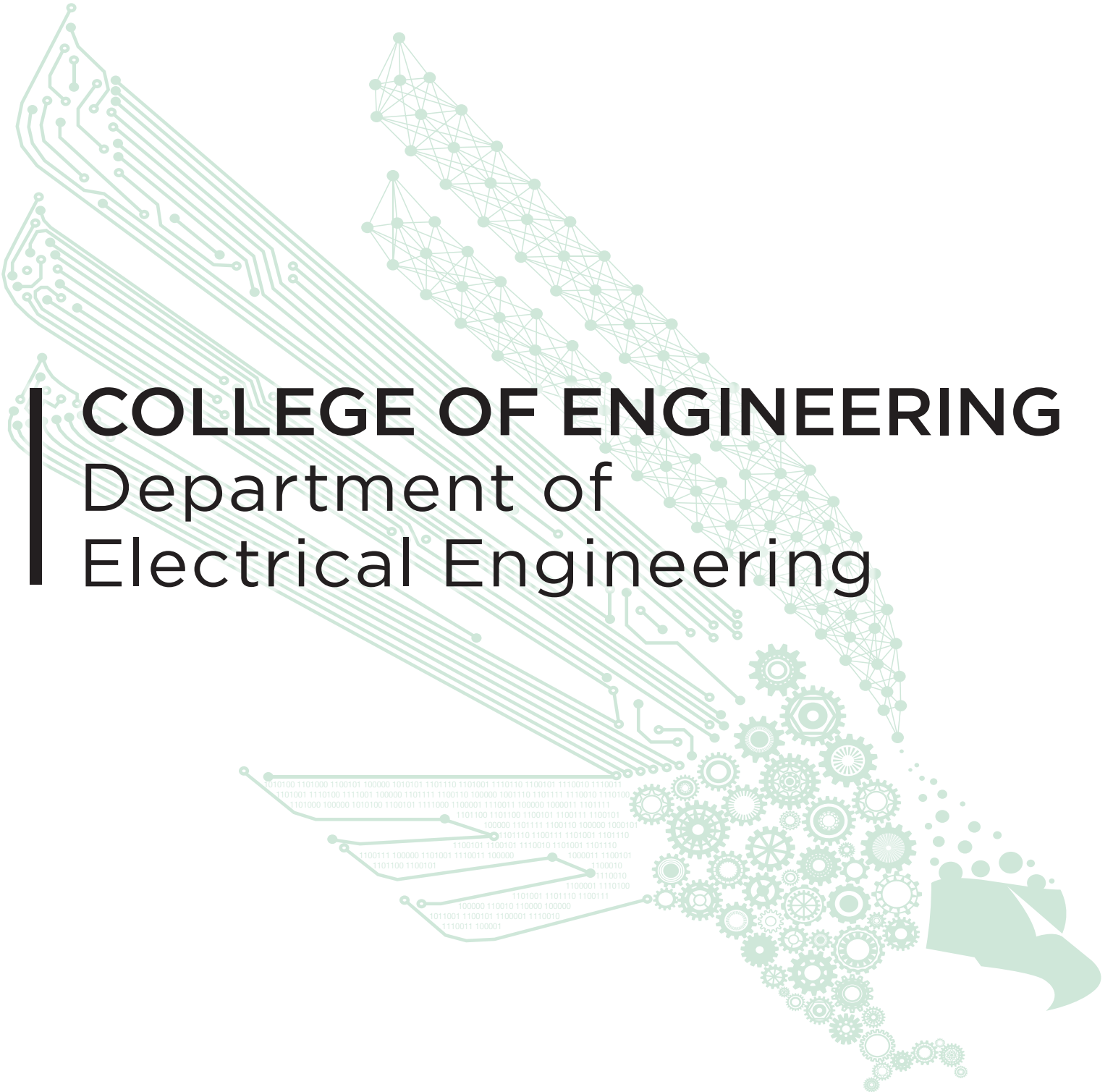
UNIVERSITY OF NORTH TEXAS

SENIOR

**DESIGN**

**Spring 2026**



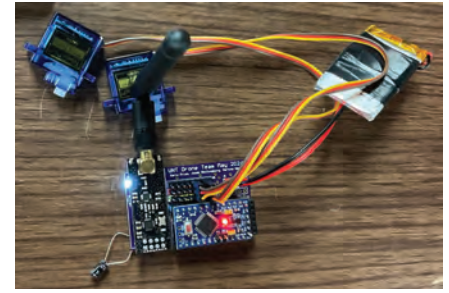


# COLLEGE OF ENGINEERING

## Department of Electrical Engineering

**Senior Design Abstracts  
Spring 2026**

# Design and Development of a Head-Tracking FPV Camera Control Board



## Team Members

Karla Frias  
Jacob Shillingburg  
Martins Ugoh

## External Sponsors/Mentors

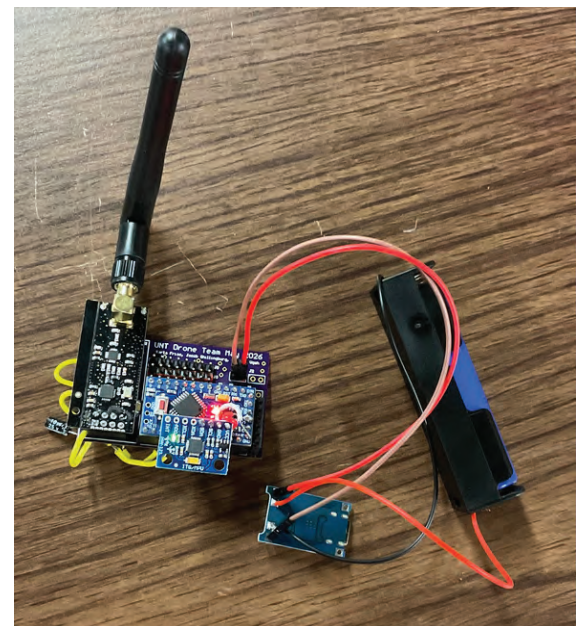
## Internal Sponsors/Mentors

UNT College of Engineering  
Dr. Namuduri

## Abstract

Our project presents the design and development of a head-tracking FPV camera control board for real-time remote viewing, with an emphasis on first responder support. The system allows an FPV camera to follow the natural head movements of a user, improving situational awareness and creating a more intuitive viewing experience for remotely operated systems such as drones. In emergency situations, this technology can help first responders inspect hazardous or hard-to-reach areas remotely before direct entry.

The design integrates embedded control, servo motor actuation, wireless communication, and a custom printed circuit board in a compact form factor. Our project focused on receiving head-tracking input, processing motion data, and transmitting control signals to a gimbal system for pan and tilt movement. The final result demonstrates the feasibility of a custom control board for FPV camera positioning and provides a foundation for future improvements in stabilization, communication range, and UAV deployment in emergency response applications.





# Solar Food Cart

## Team Members

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Sean Hash  
Anthony Tran  
Jose Villa

## External Sponsors/Mentors

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## Internal Sponsors/Mentors

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Dr. King Man Siu

## Abstract

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The Solar Food Cart presents the design and development of a solar-powered food cart that provides an environmentally friendly and portable solution for mobile food vending. The proposed system integrates a solar panel, battery storage, inverter, mini stove, and refrigeration unit to supply reliable off-grid power for cooking and cooling. With an emphasis on sustainability, the design aims to reduce dependence on fossil fuels while maintaining functionality and affordability. The solar array and battery system are engineered to support up to 1000 W of cooking power and maintain refrigeration temperatures between 2 – 8 °C for at least four hours. The food cart frame is designed to support a total load of 100 kg and remain easily movable by one person. This project demonstrates the potential for renewable energy integration in small-scale commercial applications, promoting sustainable practices in everyday food vending operations.



# Team Smart LoCATor



## Team Members

William Borton, Ayse Colakoglu, Rayanna Morton, Stuardo Quinones

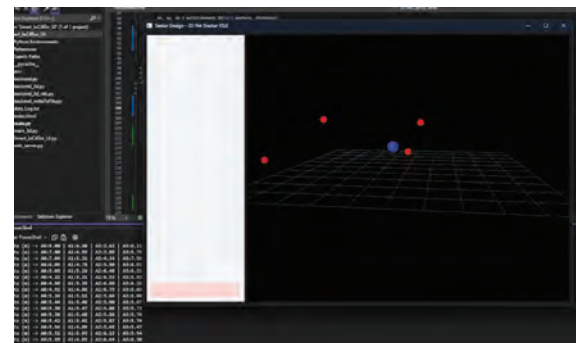
## External Sponsors/Mentors

## Internal Sponsors/Mentors

Dr. Sensong An

## Abstract

This project includes a tracking system implemented using Ultra-Wideband (UWB) technology, Time Difference of Arrival (TDoA) algorithms, and photogrammetry. Due to the nature of UWB, this product is more precise than GPS and less susceptible to interference than Bluetooth. Distances from anchor points to the tracker/tag are filtered using a nonlinear least squares algorithm. From this data a 3D visual is created. A user friendly web app will provide easy accessibility to the tracker's past and present location on this 3D map. We aim to texture the 3D map by using photogrammetry processes to mirror the environment that the tracker is in.





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