

# Keshav Anand — RSI Application

## Program Information

---

Application for Research and Science Institute (RSI), an ultra-selective (3%) program at MiT for science research  
Admission into this program results in auto-admission into **practically any US College** (due to selectivity)

I am applying for RSI so I can promote my **computer science and engineering** research that I have done

- [RSI Program Page](#) — top program in the US for high school research
- I am applying in computer science and robotics as research disciplines
- My acceptance is dependent on my prior research, accolades, and the strength of my recommendations

## Character Traits and Personality

---

- **Honest** and high **integrity**: helped catch cheaters in school multiple times.
- **Inquisitive and Curious**: always asking questions and trying to learn more
- **Hardworking and Determined**: Pushing myself to perfection in everything I do
- **Creative Problem Solver**: Able to think outside the box and come up with innovative solutions
- **Character Weaknesses**:
  - Can tend to overthink problems and overcomplicated solutions
  - Sometimes take on too much at once and struggle to prioritize tasks
  - Sometimes struggle with delegation and asking for help when needed
  - Can be overly critical of myself and others at times

## Education

---

**Plano East Senior High School, Plano**  
*STEM and Multidisciplinary Endorsement*

*August 2023 – May 2027*

- GPA: 4.73/4.0 ([View Unofficial Transcript](#))
- Class Rank: **1/1273**
- **Current Coursework**: AP Chemistry, American Studies (AP US History + AP English Language), Digital Electronics, AP Physics I, Calculus III (via Collin College)
- SAT: 1550/1600 — Reading 760/800, Maths 790/800

## GaitGuardian: Highlight Research Project

---

### Lead Researcher

[Project Portfolio](#)

- Built **GaitGuardian**, an end-to-end ML system aiding advanced Parkinson's Disease patients.
- Designed a **custom PCB** and embedded stack with a 6-DoF IMU and ESP32-S3 for real-time sensing.
- Developed a **dual-attention CNN + biLSTM** model predicting Freezing-of-Gait up to 2s early.
- Created real-time algorithms for **fall detection** and **tremor classification** using IMU signals.
- Implemented a cloud-based **visual navigation module** with transformer object detection, depth estimation, and multimodal LLM scene descriptions.
- Optimized sensor pipelines via **signal filtering**, **feature engineering**, **oversampling**, and model tuning.
- Built two wearable devices (trunk and wrist) plus a BLE-connected **forehead camera** for vision tasks.
- Demonstrated performance exceeding existing FoG, fall, and tremor detection systems.

Won 3rd Place at **The International Science and Engineering Fair**, 2nd OVERALL in Dallas → over \$1500 won

## Simply Stir: Highlight Research Project

---

### Sole Researcher

[Project Portfolio ↗](#)

- Developed a thermoelectric energy-harvesting system using a TEG for autonomous stirring.
- Designed a compact aluminum enclosure enabling efficient heat transfer and stable thermal gradients.
- Implemented electrical conditioning and load-matching to maximize TEG power extraction.
- Tested power delivery across various  $R_{Loads}$  using Vernier Probes
- Performed thermal, electrical, and mechanical characterization across multiple cooking conditions.
- Conducted viscosity-based stirring tests and identified mechanical design improvements for high-torque fluids.

Qualified to **The International Science and Engineering Fair**, 1st in Engineering @ Dallas

## FTC Robotics

---

### Lead Software Developer – Technical Turbulence (2023–Present)

[Website ↗](#), [Code Repo ↗](#)

- Designed and implemented **custom inverse kinematics and path-planning algorithms** for precise autonomous navigation.
- Integrated **computer vision pipelines** for object classification using TensorFlow Lite
- Developed novel driver control enhancements to improve driver performance
- Optimized accuracy and real-time performance through efficient sensor usage
- Lead software **Top 30 Worldwide** for autonomous programming; reached FTC State Finals.
- Led software development, version control, and testing for a programming team of 4 members.

## Skills

---

**Programming Languages:** Java, Python, Bash, C++ (Arduino), Kotlin (FTC), Limited HTML, JS, CSS

**Programming Applications:** Machine Learning, Signal Processing, Tensor Flow, Computer Vision

**Miscellaneous:** Public Speaking, CAD, PCB Design, Electrical, Competition Math

## Other Activities

---

**Vice President, LASER:** Guiding and instructing 120+ students for Science Fair

**Founder, Cricket Club:** Former USA U15 Cricketer → Formed Plano East's first cricket team

**Technology Officer, NHS:** Coded and maintained React-based portal for largest NHS chapter in the US

**Indian Film Music:** Bass, Keys, and Arrangement, member of High Octavez

[Original Music Library ↗](#)