Keshav Anand — Full Portfolio

7th Grade

Schimelpfenig Middle School, Plano *August 2021 – May 2022*

- Algebra I Honors (MR): [99, 99]
- Band: Solo Contest Distinguished in City as Flute Player
- American Football B-Team (4th String) Quarterback and Safety (10+ hrs/week)
- School Cross Country Team Member (10+ hrs/week)
- Robotics — Joined school robotics club as programmer
  - Only programmer after COVID, build code from scratch
  - Won first place in local qualifier and semi qualifier (no regional advancement)
- MATHCOUNTS and AMC math competitions — no awards
- Whiz Quiz (Trivia) Team Captain — 3rd Place in City
- Science Fair Honorable Mention at District Level
  - Using Valakku Tiri (Cotton Wick) for Self Watered Plant (Capillary Action)
- Speech and Debate Local Tournaments — 5th in Musical Pantomime (Acting), Public Forum Debate 5th

Extracurriculars and Hobbies:

- Carnatic Vocal Music — Performed in One Major Concert; Started Self-Taught Carnatic Keyboard
- Cricket — 20 Hours a Week, Competed in Local and National Tournaments; U13
- Chess classes with VAV Rajesh IM, no tournaments (ELO 1100)
- Dropped Western Piano — learned for 7 years
- Baseball starting pitcher for club team
- Started self taught bass guitar on $80 bass guitar — no shows or awards
- Self taught Carnatic Keyboard — Using portamento and mono legato for gamakams
- Competitive Math Classes
- Started baking eggless cakes as a hobby with family — no sales or awards
- Started passion for hiking in national and state parks
  - Caprock Canyons, Palo Duro Canyon, Big Bend National Park
- Started arranging music
  - Created arrangements for Garage Arts Project (Vasupradha Raghav), mixing Carnatic and Western notes
  - Recreated popular Tamil songs as Kareoke / Cover tracks (Konjum Mainakkale, Thoda Thoda, Endhan Nenjil, etc.)

8th Grade

Schimelpfenig Middle School, Plano *August 2022 – May 2023*

- Geometry Honors (MR): [98, 100]
- Band: Band Flute Lead, UIL All Region 14th Chair Flute, Solo Contest Distinguished in City, Played in Numerous Band Solos
- American Football B-Team (3rd String) Quarterback and DB (15+ hrs/week)
- School Cross Country Team Member (10+ hrs/week)
- Robotics — 2nd Year FTC School Team
  - Coded basic driver controlled system, vision processing for autonomous
  - Won first place as alliance captain in local qualifier, ahead of all other area middle school teams
- Competition Math — Represented school in MATHCOUNTS State, ranking in top 60 of Texas (2nd in Reigon)
- Whiz Quiz (Trivia) Team Captain — First Place in City, District Recognition

- Science Fair First at School Level (Did not participate further)
    - Using a non-Newtonian fluid (Oobleck) to create a shock absorbing material for knee pads
    - Tested with egg drop tests
- Speech and Debate Local Tournaments (No Award)

Extracurriculars and Hobbies:

- Carnatic Vocal Music — Performed in One Major Concert
- Carnatic Keyboard — Played for major Bharatanatyam dance performance
- Cricket — 20 Hours a Week, Top Leg SPinner in Dallas — Represented City in Southwest U15 Zonals
- Started chess tournaments, dropped coaching (ELO 1250 USCF)
- Started producing true arrangement covers, getting input from Music Director Girishh Gopalakrishnan
    - Started solo unplucked arrangements, using MIDI for all tracks
- Dropped Baseball to focus on Cricket
- Continued bass guitar self taught (on and off)
- Joined High Octavez Band as a Keyboardist
    - Performed in 2 major concerts, one in Fall and one in Spring
    - Over 250 hours put in learning sound reproduction for live playing
    - Ticketed concerts with over 1000 attendees, profits go to charity
    - Won presidential award silver for community service through band
- Continued hiking during holidays
- Got a perfect score (101/100) in Texas Music Teacher's Associated Music Theory Test
- Started learning carnatic mridangam from Vid. Raju Balan
    - Learned basic sollukai patterns and konnakol

Summer:

- Represented Dallas nationally in U15, U13 cricket tournaments
    - Won best bowler in U13 Independence Day tournament
- Performed in Carnatic Vocal Concert, and small carnatic keyboard accompaniment gigs
- CBE Algebra II — [96, 96]
- CBE Tamil via Avant for 4 Language Credits
    - 100 in Reading, 100 in Listening, 99 in Speaking, 85 in Writing
- Continued baking eggless cakes as a hobby
- Started binge watching many Tamil movies (old to new)
- Continued producing music arrangements, learning live mixing in Garage Arts Project Dallas Exhibition

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 *August 2023 – May 2027*
STEM and Multidisciplinary Endorsement

- GPA: 4.73/4.0 (View Unnoficial 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*