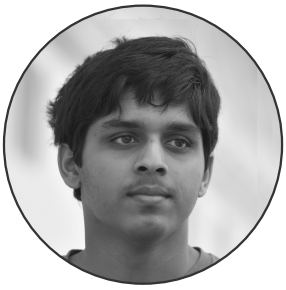

Akhil Sadam

Undergraduate in Computational Engineering, University of Texas at Austin

akhilsadam.github.io | publications | akhilsadam | akhil-sadam | artificier

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simulation architect / automation engineer, independent game developer and composer.

research - game - arch-vis - art - models - music

Research

UTKL Group -- Design, Simulation of PET & other Gamma Detectors — Jan 2020 -- May 2022

- Simulation of Positron Emission Tomography Detectors (PET) and similar gamma-matter interactions
- Currently simulating a novel 1-meter barrel PET which would employ inexpensive plastic scintillators
- Assisted with simulation of an extruded plastic wavelength shifter alternative for the LEGEND experiment
- Using Geant4, ROOT and Python via CMake, Bash and the Linux environment (C++).
- Implemented machine learning and statistical algorithms including a KNN and CNN
- Meeting with Dr. Lang of UT Austin and others bi-weekly to discuss progress and refinements
- Video and presentation here, analysis code here, and simulation code here

Phonon Momentum Group -- Experiment Design, Theory & Analysis — Aug 2020 -- May 2022

- Initial experiment design and estimates of phonon angular momentum measurement
- Using a high-Q double torsional oscillator and the Einstein-de Haas effect
- Using Python to fit resonances and calculate forces from capacitive and fiber-optic-interferometry
- Initial findings were presented by the group at the APS (American Physical Society) March 2022 meeting
- Meeting with Dr. Markert of UT Austin and others weekly to discuss progress and refinements
- Presentation here

Recent Publications

C Layden, K Klein, WJ Matava, A Sadam, F Abouzahr, M Proga, ...

Design and modeling of a high resolution and high sensitivity PET brain scanner with double-ended readout

Biomedical Physics & Engineering Express 2022

A Sadam, C Layden, K Klein, W Matava, K Lang

An Inexpensive Polyvinyltoulene Barrel PET Scanner Design

Bulletin of the American Physical Society 2022

W Matava, K Klein, F Abouzahr, C Layden, A Sadam, J Cesar, S Park, ...

Cost-Effective Depth-Encoding Methods for Time-of-Flight PET Scanners

Bulletin of the American Physical Society 2022

M Dwyer, D Shoemaker, A Sadam, J Markert

Measurement of Phonon Angular Momentum via the Einstein-de Haas Effect, Fiber-Optic Interferometry, and a High-Q Oscillator

Bulletin of the American Physical Society 2022

K Klein, W Matava, C Layden, A Sadam, K Lang, M Proga, S Tavernier

Time-of-Flight PET for Proton Therapy (TPPT)

Bulletin of the American Physical Society 2022

A complete listing is available here.

Skills

Languages

Java, C#, C++, Python, RUST, ROS, ROOT, Geant4, OpenFoam, Mathematica, MATLAB, R, Fathom, HTML, CSS, JS, HLSL, Bash

Deployment
TACC, Container Orchestration, Docker, Kubernetes, Redis, Flask & Dash

Linux
Ubuntu, Debian, MS Hypervisor, VirtualBox, VMWare Player, Windows Subsystem for Linux

IDE
Visual Studio & VSCode, Jupyter Notebook, Anaconda, Make, CMake, Git, GitHub

Game & 3D
Unity, Substance Painter, Designer, Alchemist, Quixel Bridge & Mixer, Blender, Cinema4D, Houdini, Meshroom, Revit

2D Art & Video
Blackmagic Design DaVinci Resolve & Fusion, GIMP, Krita, PhotoscapeX

Music
MuseScore, FL Studio, Cakewalk, Reaper, Kontakt, Reaktor

Reporting
MS Word, Excel, PowerPoint, R Markdown

Languages (natural)
Native Proficiency in English, Limited Working Proficiency in French, Native Proficiency in Telugu (spoken)

Interests
Computational Physics, Computational Mathematics, Computational Biology, Natural Language Processing, Data Analytics, Physics Simulations, Game Development, 3D Modeling & Photogrammetry, Cinematic & Electronic Music Production, Film Scoring, Piano, Literature

Experience

Wilderness First Responder — Jan 2022 -- Jan 2024

- Competency in conducting a thorough physical exam, obtaining a patient history, assessing vital signs, providing emergency care in the wilderness, and making crucial evacuation decisions.
- Experience in: Patient Assessment System, Documentation, Medical Legal, CPR, Spinal Cord Injuries, Long-term Patient Care, Chest Injuries, Shock, Head Injuries, Wilderness Wound Management, Athletic Injuries, Fracture Management and Traction Splinting, Dislocations, Cold Injuries, Heat Illness, Heat Illness, Altitude Illness, Cardiac, Respiratory and Neurological Emergencies, Abdominal Emergencies, Mental Health Emergencies, Bites, Stings and Poisoning, Allergies and Anaphylaxis, Diabetes , Search and Rescue, Leadership, Teamwork, and Communication, Communicable Disease, Lightning, Submersion, Urinary and Reproductive System Issues, Medical Decision Making, Common Wilderness Medical Problems, and Wilderness Drug and First Aid Kits.
- Provider: Chris Froehly and Leon Hudson, NOLS

MIT Beaver Works Summer Institute -- Autonomous Air Vehicle (Camp) — Summer 2018

- Worked as part of a 4-person software development team
- Developed autonomy code in Python, via ROS, for an Intel RTF drone
- 40 hours per week, 4 weeks

Austin Area Homeschool Science Team - Science Olympiad Committee Member — Fall 2017 - Spring 2018

- Communicated weekly with Science Olympiad Coach
- Organized Olympiad practice during weekly meetings
- Arranged databases for team members to input their event preferences before major competitions
- Determined members of A and B Teams (with Science Olympiad Coach)
- Determined events for each team member (with Science Olympiad Coach)
- Registered teams for invitationals, regional, and state competitions
- Ensured correct forms were collected for competitions
- Maintained and posted schedules for Olympiad competitions

Austin Area Homeschool Science Team - Science Bowl Committee Member — Fall 2017 - Spring 2018

- Communicated weekly with Science Bowl Coach
- Conducted Bowl practices during weekly meetings
- Determined members of A and B Teams (with Science Bowl Coach)
- Determined captains of Bowl teams (with Science Bowl Coach)
- Organized outside-meeting practices
- Assisted with team registration
- Ensured correct forms were collected for competitions

Outreach

Pennsylvania Homeschoolers - AP Computer Science TA — Fall 2018 -- Spring 2020

- Graded the Java homework of 3-7 students
- Served as point-of-contact for the 3-7 student group
- Helped with student questions
- Worked one-on-one as a tutor if required

Pennsylvania Homeschoolers - AP Physics I LA — Fall 2018 -- Spring 2019

- Helped students with their assignments

Private Tutoring -- Math and Physics Tutor — Fall 2019

- Tutored a student on the autism spectrum
- Math and Physics homework, and PSAT/SAT math prep

Education

UNDERGRADUATE

0.0.1 Computational Engineering (selected coursework) — Fall 2020 – Present

- M365C Real Analysis I, M375T Predictive Analytics
- COE332 Software Engineering and Design — In Progress
- COE322 Scientific Computation, COE311 Engineering Computation
- COE347 Introduction to Computational Fluid Dynamics — In Progress
- COE321K Computational Methods for Structural Analysis — In Progress
- ASE320 Low-Speed Aerodynamics
- E316N World Literature — In Progress
- UGS302 Meet Your Biological Clock, MUS306 Elements of Music
  Overall GPA: 4.0

0.0.2 Audit: The University of Texas at Austin — May 2020

- PHY336K Classical Dynamics, PHY373 Quantum Physics : Foundations
- PHY355 Modern Physics & Thermodynamics

0.0.3 Dual Credit: Austin Community College — May 2020

- Calculus 1/MATH 2413, Calculus 2/MATH 2414, Calculus 3/MATH 2415, Differential Equations/MATH 2420,
- Linear Algebra/MATH 2318, Discrete Math/MATH 2305
- Eng. Physics 1/PHYS 2425, Statics/ENGR 2301, Dynamics/ENGR 2302
- College Comp. I/ENGL 1301, College Comp. II/ENGL 1302, Macroeconomics/ECON 2301
- French I/FREN 1411, French II/FREN 1412, French III/FREN 2311

0.0.4 AP Courses with Exam — May 2020

- AP Biology, AP Calculus BC, AP Computer Science, AP Physics C Mech, AP Physics C E&M, AP Statistics, AP Chemistry

Overall GPA: 4.0

Honors

- University of Texas Bennett Competition – 4th place in Calculus — Fall 2020
- OPhO (Online Physics Olympiad) 17th team out of 340 worldwide — Summer 2020
- USAPhO (USA Physics Olympiad)
  - Qualifier (USAPhO not held due to COVID-19) — Spring 2020
  - Bronze Medalist — Spring 2019
- USNCO (USA Chemistry Olympiad)
  - Semifinalist — Spring 2020
  - Semifinalist — Spring 2019
- AAPT Physics Bowl 2nd place in Region — Spring 2018
- AIME Qualifier — Spring 2016, 18
- MIT Beaver Works Summer Institute: Autonomous Air Vehicle 3rd place (Team) — Summer 2018
- AP Scholar with Distinction — Spring 2019
- AP Scholar with Honors — Spring 2019
- President's Honor Roll at Austin Community College (8 semesters) — Fall 2016 – Spring 2020
- ACC (Austin Community College) Math Tournament (AMATYC SML)
  - 1st place — Fall 2019
  - 1st place — Spring 2019
  - 3rd place — Spring 2018
  - 1st place — Fall 2017
  - 2nd place — Spring 2017
  - 2nd place — Fall 2016
- University of Houston HS Math and Science Competition
  - 1st in Calculus — Fall 2018
  - 1st in Physics — Fall 2018
  - 2nd in Calculus — Fall 2017
- Texas Regional Science Bowl (Team)
  - 3rd place — Spring 2019
  - 5th/6th place — Spring 2018
  - Top quartile — Spring 2015, 16, 17
- Texas State Science Olympiad
  - 3rd place in Remote Sensing, 4th place in Thermodynamics, 5th place in Optics, 6th place in Hovercraft Spring 2018
  - 2nd place in Optics, 4th place in Hovercraft — Spring 2017
- ABRSM Theory Grade 3 Certification with Distinction — Fall 2018
- ADMTA
  - Jazz, Pop, and Rock Festival (Superior Rating) — Fall 2017, 18
  - Baroque and Classical Festival (Superior Rating) — Fall 2017

Additional Information

Work Eligibility: Eligible to work in the U.S. with no restrictions.