



Mid-Term Report

2021-22

COUNCIL

Team and Summer Project Recruitments

- A centralised recruitment process was conducted this year for team recruitments as well as for selecting students for summer projects.
- 107 students were recruited from over 425 applicants.
- Over 1600 students applied for Summer Projects and more than 1100 students were selected across 45 different projects.

Revision of Team Guidelines

- New Team Guidelines have been passed by the Senate.
- A revised team structure comprising junior members, senior members, project leaders and team heads has been introduced.
- The process for forming new teams has been formalized. New teams must have a faculty advisor and will be started as council projects, initially drawing budget under this head from the Council itself.
- The proposal intends to make teams more open to the campus community. The teams will now provide events in GC, and nominations for all posts in the teams will be made over the students' mailing list.

SnT Summer Camp 2021

- SnT Summer Camp 2021 was successfully completed with more than 45 projects and 800+ students.
- The camp was branded this year as semester projects as Y20 has

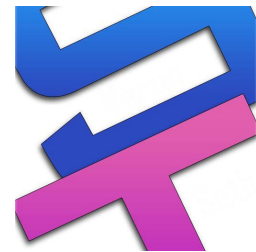
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their regular semester in progress.

- There were midterm and end-term evaluations conducted by a committee comprising General Secretary and Associate Heads.
- The list of students that completed the projects can be found here along with the documentation and poster of every project can be found at: [Semester Projects 2021](#)

Introduction to the Council

- The SNT orientation session for Y20 UG students was conducted.
- All the clubs and teams showcased their past projects and work on a Zoom call.
- Introductory sessions and workshops were conducted by all the clubs and societies.

Scientific Communication Workshop

- A two-day workshop that introduces participants to communicate specific research outputs to lay people was conducted.
- The workshop targeted students who were interested in science writing, with a special focus on communicating scientific findings to the public.
- Since this was the first time such a workshop was conducted, only 35 students were selected. The workshop was free for these students.

Inter IIT Techmeet 10.0

- This year it was hosted in IIT Kharagpur in an online mode.
- IITK bagged 1 gold, 2 silver and 4 bronze medals out of the 12 events conducted. Our overall position was 2nd (1st being the Organising IIT).
- There were a lot of constitutional, organisational and ethical issues with the conduction of the event and appropriate measures will be taken to rectify the same.

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CLUBS

Aeromodelling Club

Summers:

- This year a total of three projects for the campus community that covers the basic aspects of aeromodelling were conducted.
- **Plane Design and Analysis using XFLR5:** This online project, basically focused on the design and stability aspect of a plane. Some of the key topics that taught in this project were the basics of aerodynamics, the theory behind aerodynamics that is used in XFLR5 software, parameters behind successful flights, finding perfect airfoil designs by doing Xfoil direct/inverse analysis, checking stability by analysing the plane on various parameters like viscosity, drag, lift, etc. and examining the graphs that were obtained after analysis.
- **CAD design and AutoDesk Fusion 360:** Project participants became aware of 3D modelling in general and Aircraft modelling in particular. A systematic approach is taken by providing regular support material, frequent discussion sessions. Every necessary detail regarding 3d modelling is inculcated in participants by providing them with challenging assignments and tasks. Participants also got a chance to get familiarized with aeromodelling basics. Design Exhibition was conducted where participants got a chance to showcase the 3D modelling skills that they have learned in the project. The unconventional and emerging field of Freeform modelling was also introduced in the project.
- **Drone Bootcamp:** We started off by exploring dynamics and kinematics of a quadplane, PID control and PID tuning, introduced control theory and first and second-order systems, a power supply diagram, and introduced ROS and ROS terminal. MATLAB and Simulink were also introduced and a basic Introduction to Gazebo was given to the participating students. We also taught students how to use the SITL (Software in the loop) software of Mission

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Planner to virtually fly and control the drone, plan the flight also other modes and features present in Mission Planner.

Odd Semester and Winters:

- **Water rocket workshop:** This session was conducted with the secretaries and we prepared the theory and logistics of a Water Rocket workshop for the upcoming Y21 batch. There will be five volunteers from the secretaries who will construct the water rocket through three different approaches and can hand-hold the juniors through the workshop. Other secretaries will cater to misc. doubts from the juniors.
- **XFLR5 introductory session:** In this session, we taught the participants the various parts of an aeroplane, the basics of aerodynamics, and then taught how to analyse airfoils, design a plane, set its inertia, do stability analysis (fixed lift) on the plane, and finally, inspect the graphs obtained.
- **Glider workshop:** Secretaries were taught fabricating 1-metre wingspan gliders, and individual airfoils were to be designed and printed. Using these airfoil patterns we fabricated styrofoam gliders and tow planes. Students bought tools and construction material on their own and constructed the glider.
- **Blog writing:** The blogs spanned topics from 3D aerobatic models to exploring different aerofoils in xflr5 and documenting them for ease of use for the upcoming events. They are being now uploaded weekly to the Official Medium Handle of AMC and also on the Aeromodelling Club IITK FB page.

Even Semester

- **Projects for Secretaries:** We conducted two projects for the aeromodelling club secretaries before midsem namely MATLAB and ANSYS and there were 15 secys in the MATLAB project and 6 were in ANSYS. We managed to get M.Tech students for the

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project mentors, one for MATLAB and two mentors for ANSYS. Doubt session was conducted once a week and an assignment was given every week. The aim of both the project was to provide basic knowledge of MATLAB and ANSYS respectively such that more advanced projects could be done in future years.

- Techkriti '22: We (coordinators and secretaries) also designed two problem statements for the Takeoff Event under Techkriti 22 and judged the participants for the same. These problems were:
 - CreatiVTOL - Related to VTOL aircraft theory and design
 - Petó-fortío - Related to the design and analysis of an aircraft.

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Astronomy Club

Summer:

- **Club website:** Since the club did not have a proper website, a new club website was created from scratch and hosted on GitHub. The site is regularly updated with relevant content.
- **Summer Projects:** In the Summer of 2021, Astronomy Club offered 3 projects ranging from astrophysics to rocketry. Combined participation of over 70 was seen. The complete project content has been compiled and hosted on the club's GitHub repository for future reference.
- **Computational Astrophysics:** The mentees first learnt the basic know-how-to of Python and then proceeded to learn various libraries and computational techniques from an Astrophysical point of view. The project ended with a detailed analysis of the Pleiades star cluster.
- **Space: The Final Frontier:** The project revolved around designing and planning a space mission. Mentees were introduced to the basics of space exploration and explored the basics of rocket design and propulsion systems as well as the mechanics behind it. With the help of KSP simulations, they also designed entire space programs.
- **Reading, Analysis & Discussion (RAD):** The project aimed to study several astrophysical objects and phenomena from a theoretical astrophysical standpoint. Mentees were introduced to the basics of astronomy and then explored the physics behind binary star systems, stellar structures, and galaxies; this also included a detailed analysis of their formations and various types of the same.
- The Apollo 11 documentary was streamed on the Club's Discord server which saw the participation of over 50 watchers.

Odd Semester:

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- An Astrophotography Workshop was organized for the campus junta. The workshop was taken by Soumyadeep Mukherjee, with a turnover of about 100 participants.
- The club organized [Hyperion](#), a 48 hour nationwide case-study challenge on Autumn Astronomy Day hosted on D2C. The competition observed the enthusiastic participation of 400+ teams registering for the event. A felicitation ceremony was organized to announce the winners with the chief guest being Prof Pankaj Jain of the Department of Physics.
- Astro Monthly: The club started a monthly newsletter containing current affairs of Astronomy and Astrophysics and any upcoming astronomical events such as meteor showers.
- After the astrophotography workshop, the Amateur Astrophotography Challenge was released to encourage the campus junta to try out astrophotography.
- A weekly meme series has been resumed for social media posts. The club creates its own original memes and posts them along with a detailed theoretical background for the proper dissemination of astronomical knowledge.
- The club created a [NASA-APOD Bot](#) for the Discord server which fetches the NASA Astronomy Picture of the Day every 24 hours and posts it on the server.
- The club also released its first blogpost of the tenure talking about the Starship, SpaceX's attempt to create the largest rocket in history to take humans to Mars.

Winter:

- Pre-Orientation Event: The Eyes On the Skies competition, which includes Astro Riddles and Astrophotography, was arranged as a very preliminary competition for the upcoming younger cohort (Y21).

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- **Introductory Lecture:** To give a glimpse of astronomy and its related aspects like software for observation purposes, astronomical phenomena, etc. to the Y21 batch, an introductory lecture was organized.
- The Don't Look Up movie was streamed on the Club's Discord server which saw the participation of over 50 watchers.
- The club also released the first edition of its yearly magazine Cygnus, which covers broader areas ranging from its history to club activities, astronomical research highlights to planned launches, a mystery to constellation crossword puzzles, and much more.

Even Semester:

- **DIY Mini Projects:** The club organized a DIY mini-project on Orbital Perturbation which saw an enthusiastic response from Y20s. The documentation and step-by-step guide will be released on the club website which will enable other campus juntas to follow along.
- **Mandakini:** Astronomy Club organized its flagship event Mandakini, in association with Techkriti'21. The events were as follows:
 - Observe, Analyse, Solve (OAS): Prizes worth 20k
 - AstroQuiz: Prizes worth 15k
 - AstroTreasure: Prizes worth 10k
- **VODs:** The club has prepared small video clips of various astrophysical phenomena such as triple star systems to replace static social media posts such as photos by instead using dynamic clips.
- **Group Discussion:** A group discussion on Space Mission will be conducted exclusively for Y21.
- **Documentary streaming:** A documentary will be streamed in Lecture Hall.

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Electronics Club

Summer:

- A total of four different projects were undertaken during Summer'21.
- **Automatic music transcription:** The project aimed at annotating audio and creating a kind of "sheet" or piano roll for generating music from it at a later point in time. The approach for music transcription was similar to that of speech recognition, the project involved learning of domains like signal processing and deep learning.
- **Rustduino:** The project's primary goal was to understand the Arduino Architecture at its core and develop a Rust Crate ("library") for standard Arduino sensors/microcontrollers (ex: MPU, SERVO MOTORS, SERIAL COMMUNICATION) using a Hardware Abstraction Library and the AVR-GCC compiler. RUST offers memory safety, efficiency, among other benefits, making it essential in the IoT Hemisphere. However, work in this area has been scarce, owing to the lack of many standard libraries for microcontrollers, which was precisely our goal here. The project involved an introduction to rust, an introduction to Arduino Hardware, and several Micro Controllers/sensors.
- **3D pose warping:** The students implemented the real-time reposting of an image of a human into any desired novel pose. To generate the desired pose, dense feature voxels were implicitly learned from the given 2D poses and then these voxels were warped according to the desired poses. After obtaining the desired 3D feature volume, these voxels were converted back to 2D space using a convolutional decoder.
- **Crypto-FPGA:** In the project, students learned the extremely parallel processing power of FPGAs and implemented the DES algorithm using FPGAs.

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Odd Semester and Winter:

- **Lecture on Blockchain Technology (Jun'21):** An Introductory session for the student community was conducted and was taken by Y15 IITK alumnus, former coordinator of Electronics Club - Prince Saroj. It was an introductory lecture conducted in order to brief the students with concepts like proof of work, blockchain, transaction, and mining. The talk was accompanied by a live demo on programming blockchains and deploying smart contracts on the most popular public Blockchain Ethereum.
- **Introductory Lecture & Workshop (Dec'21):** A lecture on ICs and microcontrollers was conducted for Y21s. Various domains and kinds of projects that the club works on were discussed in the session. A workshop was conducted on TinkerCad. Y21s got to work on two interesting problem statements, one involving the use of ICs, and the other statement was based on using the Arduino. The workshop saw good participation. Later, a form was also floated where Y21s submitted links to their working circuits.

Even Semester:

- **Lecture on Designing filter in Microwave Circuits (Jan'22):** The aim of this talk is to introduce the methodology of microwave circuit design. You will also get to see a live demonstration of designing a bandpass filter using the AWR software. Speaker: Nitish Vikas Deshpande, Y17 EE, IITK Alumnus.
- **Intra-Club Reading Group:** Research papers were reviewed and discussed amongst the secretaries and the scope for future implementations was assessed. This was followed by transfer of knowledge sessions for the secretaries to bridge the gap created due to the online semester.

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Finance and Analytics Club

Summer:

- **Pairs Trading Strategy:** A project involving learning a trading strategy based upon statistics and time series. It involved reading papers and blogs and then implementing the strategy in python followed by backtesting.
- **Stock Price Prediction Using Deep Reinforcement Learning:** A project involving learning trading strategies based upon deep reinforcement learning. It involved learning about machine learning through various courses and blogs and implementing the strategies in python followed by backtesting.
- **Fundamental Analysis of Stock:** The project involved calculating the FCF to the firm to calculate the intrinsic value of the stock. This helps in finding whether the stock is undervalued or overvalued basis on the market scenario and the company's financial health.
- **Markowitz Portfolio Management:**
 - Efficient Frontier & Security Market Line
 - Maximising Sharpe Ratio
 - Optimisation using ML models
 - Portfolio Risk Analysis

Odd Semester and Winter:

- **Webinar on Financial Literacy:**
 - 3 Stages for being "Financially Healthy": Financial Literacy, Financial Independence & Financial Freedom
 - What is Financial Literacy (FL) & why one needs FL/How to use money and not to be used by money?
 - Behavioural Aspect: Prioritizing Needs, Wants, Desires
 - How to save during the COVID-19 phase?
 - Budgeting, Income, Expense, Savings, Insurance, and Investments
 - Understanding Loans and debt

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- Importance of Financial Planner
- Do's and Don't of Financial Planning
- **Crypto for Beginners:**
 - A session involving the discussion related to what blockchain technology is.
 - Going into the depths of crypto, mainly into the crypto stocks that reached a sky-high.
 - This session was conducted by Akshat Srivastava, an INSEAD alum.
- **Financial Education Workshop:**
 - Session in collaboration with Finance and Investment Cell, SRCC.
 - Helped the campus junta to gain knowledge on fields like mutual funds and bonds, taxations, and insurances.
 - The event was followed by a case challenge.
- **Machine Learning in Finance Talk by Hrishabh S:**
 - A session involving discussion on the use of Machine Learning in the field of finance.
 - The session was followed by a LinkedIn post from the official account of the speaker.
- **INSEAD MiM (Master's in Management) Webinar:** INSEAD is a graduate business school with locations in France, Singapore, Abu Dhabi & San Francisco. FAC collaborated with INSEAD to hold a webinar with the topic "Get 7 key tips to make a stand-out MiM application by INSEAD".
- **Trading Exploration Workshop:** A workshop with the aim to empower students to explore a variety of career opportunities for free so that they can kickstart their career exploration journey in the right direction in the fields related to trading.
- **Investment Banking Experience Program (IBEP):** The Investment Banking Experience Program (IBEP) was a live project that helped students gain work experience in private equity & venture capital organized by FinLatics.

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- **News, Books event:** We had a month-long series on News & Book discussions. The events were a success and we had several insightful & interactive sessions on the
 - 1) Indian Telecom Fiasco
 - 2) Evergrande Crisis in China
 - 3) 2 book discussion sessions on Rich Dad, Poor Dad
- **Jargons on Insta, Facebook page:** We restarted with Demystifying Jargons series on our Facebook, Insta page. These jargons give you glimpses through basic financial concepts and help you grow your financial knowledge from the core.

Even Semester:

- **Intro to Stock Market Session (Jan 22):**
 - This live session was primarily for the purpose of imparting Stock Knowledge to Y21.
 - Topics such as commodities, assets, and fundamental analysis were also discussed.
 - A total of 300 people attended the workshop
- **Non-Core Weekend (11 - 13 Feb 22):**
 - Over the weekend, 11 speaker sessions and three workshops were held.
 - Speakers came from a variety of backgrounds.
 - C Rangarajan, former Governor of the Reserve Bank of India, Mr Mukesh Kalra, founder of ETMoney, Mr Sheshank Malhotra, Vice-President of Swiss Re, and Mr Rajil Jain, Data Scientist at Facebook, USA were among the notable speakers invited.
 - A continuous attendance of roughly 150 people was present at each session. Aside from it, competitions such as Case-O-Mania were held. Numerous calls were made to other IITs and Engineering Colleges' Finance Clubs.

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- Y21 was contacted for volunteers, and a whopping 300 students signed up
- **Inter IIT 10.0 (March 22):**
 - Took part in Mudrex's Algorithmic Trading Competition (MId Prep) and represented IIT Kanpur.
 - The team built over 30 strategies and out of that best three were submitted.

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Programming Club

Summer:

- **IITK Coin:** The project aimed to build a pseudo-coin system for use in the IITK Campus. The involved team developed the back-end system using Go as their primary programming language.
- **SPO Career Portal:** This project was done in collaboration with the Students Placement Office, IIT Kanpur. It was aimed to develop a web application for the campus community wherein various intern offers coming through SPO could be unified. This portal would be launched for the use of students in January 2022.
- **Competitive Programming Bootcamp:** This project was aimed at students who were beginners at competitive programming to help them get started with DSA. It was organized as an open bootcamp, wherein no pre-requisite skills were required.
- **Campus Discuss:** This project was continued as a long project from the last tenure. The web app had been completed and this year the project was aimed to work on the mobile app. The aim of the project was to build a discussion platform for the campus using React and Django.
- **6 Weeks 6 Languages:** The aim of this project was to acquaint people with the different programming languages and their pros and cons.
- **Introduction to Machine Learning:** The aim of this project was to teach students Python, Data Science, and Machine Learning through actual ML competitions to give them the exact idea of how ML is implemented in real-world scenarios and in the industry.
- **Game of Blocks:** The aim of this project was to introduce the Y20 to Ethereum, blockchain and solidity. We developed smart contracts for various game-theoretic mechanisms through this project.

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- **Model Zoo:** Through this project, we aimed to expand our existing repository of machine learning models. We implemented various papers related to the advancements in machine learning and prepared blogs for the same. This project consisted of Y19, but mostly Y20.

Lectures:

- **ICPC: How to get started?:** This lecture was held on YouTube Live. It was an introductory session on ICPC, taken by the two members of the ACM ICPC World Finalist team from IITK. This was done to inform the campus community about the various aspects of the ACM ICPC, how to qualify the regionals and how to get started with its preparation.
- **Let's talk Blockchain:** The talk is on the various forms and use cases of blockchains starting from the popular cryptocurrencies to the upcoming areas such as NFTs, Defi, and other social applications, and future possibilities with blockchains that are currently unexplored. This will be held on the 28th of October, 2021.
- **Web 3.0 and Future of the Internet with Biconomy:** This workshop served as a primer to blockchain technology, cryptocurrencies, and their evolution. Conducted by Biconomy, in association with Lumos Lab, the talk discussed the rise of decentralized technology, crypto companies, and why it is gaining traction with this as a basis.
- **Introduction to Programming:** This lecture series is aimed to get Y21 acquainted with basic programming and logic syntax. The main motive is to cover up for students not having ESC101A in their current semester.
- **Introduction to Open Source:** Lecture series on open source and Google Summer of Code(GSoC). The talk will be given by participants from GSoC'20.

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- **Linux Blog Series:** This is a multi-part blog series aimed as an explainer of the various low-level components of a Linux Distribution. This series is hosted on PClub's Medium publication.
- **Introductory Session on Git and Bash:** This lecture series was an introductory session on version control technologies, including git and acquainting the Y2Is with generic programming practices in bash.

Industrial Collaborations:

- **Univ AI: Geoffrey Hinton Fellowship (GHF)**
 - About: GHF is a talent development and recruitment platform. It helps you learn, assess yourself, and get hired in top-tier companies no matter your level: beginner, intermediate or advanced. Top employers use our recruitment system, for both internships and jobs which are accessible by the GHF participants.
 - Perks: IITK students would be able to participate in GHF hackathons, which would be conducted at regular intervals without any participation fees. The winners and their colleges will be featured on the GHF leaders list - India's first and only ranked list of Data Science and AI enthusiasts - for companies seeking to hire the best, winners would additionally earn cash rewards.
- **Biconomy Co.**
 - About: Biconomy provides Web 3.0 services. It helps making dapps, and they also have a token of their own.
 - Perks: Our students will have access to a wider range of opportunities regarding Blockchain internships. It will also provide an opportunity to build up skills, and win goodies through hackathons.
- **Qualcomm: Industry Perspectives on Compiler Design:**
 - This presentation talks about the challenges to sustaining this kind of rapid evolution, the need for hardware accelerators and

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the increased significance of compilers in this context. This talk provides information about Domain Specific Languages like Halide/TVM and how they are trying to address some of these challenges with aid from Compiler Design. Apart from this, the presentation also includes details about the importance of software security and how static analysis tools can help address security issues.

Events/Competitions:

- **Sport Programmer of the Month Challenge:** This challenge series was aimed at improving the competitive programming culture in Y20 students. Over 230 Y20 students registered for the challenge. We have completed 8 editions of the challenge so far, with regular winner announcements on the Codeforces group and our Facebook group.
- **Test Series from Archives:** This contest series was aimed at Y19 and Y18 students sitting for internships and placements. It was an initiative of Masood Alam (Y16). We organized 30 contests over a period of 3 months. The contests had questions that were asked by various companies in their placement/internship tests. The editorials for the contests were also published.
- **Freshers Programming Contest:** FPC will be conducted during Y21's mid sem breakthrough codeforces over a period of days. All the problems are original and created by the club. A blog containing material relevant to FPC would be released a few days earlier.

Other initiatives:

- **Pclub.in:** Pclub.in was originally designed a few years back and the design is outdated with respect to current standards. We are in the process of revamping the website with a modern look.

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- **Guess the PL (Insta Series):** This is a multi-part insta series aimed to give one-liner descriptions of various programming languages. This series was hosted on PClub's Instagram page.
- **Instagram & Discord:** We created an official PClub handle on Instagram at the request of the secys. We will be conducting small events, like quizzes on weekends, and coming out with informational posts on the Instagram account.
- We also shifted to Discord from Slack, and we currently have almost 1600+ people on our server.
- **Hackathons:** 4 teams of secys from the Programming Club were encouraged to participate in the Manthan hackathon, the coordinators mentoring each of the team. We also encouraged various secys to participate in the HCL-C3i hackathon. Our team for the problem statement "Identification of online fake content" secured a Top-3 position nationally in the Manthan Hackathon.

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Robotics Club

Summer:

- **3D Shape Completion For Autonomous Vehicles:** To build a model which predicts the shape of objects detected through LiDAR data and RGB images
- **Swarm Robotics:** To get an idea about swarm robotics by implementing algorithms involved in swarm robotics. The goal is to try and make algorithms for different tasks from scratch and use existing algorithms and their modification
- **Two-Wheeled Self-Balancing Robot:** Design controllers like PID, LQR for the two-wheeled robot, KALMAN filtering and their implementation and simulation in MATLAB.
- **Reinforcement Learning:** To introduce enthusiasts to the theory and applications of RL

Odd Semester and Winters:

- Conducted a ROS (Robot Operating System) workshop virtually. Due to uncertainty involving Linux distributions and ROS installations, an online tool TheConstructSim was used successfully. The workshop had 90+ participants of which 45 followed through and successfully completed the workshop.
- Conducted an interactive talk on the topic "What if . . . Robots fought our wars?". Talked about Current Research and inventions, future prospects and social, ethical and economic pros and cons related to the use of Robotics and AI in the military.
- **All IITs Robotics Association:** Collaborated and formed a team of robotics club members from 6 different IITs. Organized a pan India competition based on a problem statement proposed by one of the sponsors Peppermint.

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- **Techfest - Meshmerize:** A team comprised of 6 members participated in the competition. Qualified the first round of the competition
- **Y21 Orientation:**
 - **Introductory Interactive Session:** They were introduced to the basic aspects of Robotics such as hardware (Designing, machining and manufacturing), Electronics (power supply, Controllers, Sensors, actuators and communication Modules) and Software (Navigation, Perception and Simulation).
 - **Introductory Workshop:** Machine Learning in combination with Computer Vision was used to detect a hand based on a pre-trained model in the mediapipe python library. Different hand gestures had their respective specific key-bindings through which an online game was given keyboard signals to control the in-game vehicle.
- **Inter IIT Techmeet 10.0:**
 - Participated in the silicon labs social entrepreneurship challenge.
 - A team of 10 people worked on multiple ideas and 1 idea was shortlisted for the final presentation.
 - Made CAD and developed a working prototype for the proposed solution within the proposed theoretical cost of the prototype.
 - Prepared an extensive report of the research done and the working of the proposed solution.
 - Won Silver medal in Inter IIT Techmeet 10.0
- **Naverse (Workshops and Talks in collaboration with NTU):**
 - Collaborated with The Institution of Engineers, Singapore (IES), NTU to conduct talks and workshops on various topics in robotics.
 - The Talk was on the topic "Robots: Go Deep and Go Meta" delivered by Assoc Prof Cai Yiyu from the School of Mechanical and Aerospace Engineering (NTU).

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- Workshops relating to Computer Vision, Printed Circuit Board design and Arduino were conducted which had 100+ participants from IITK.
- **Alumni Talks:**
 - Conducted a talk by Mr Umakant Soni on How to build an AI & Robotics Startup from a venture capitalist's perspective. Mr. Umakant Soni is an IITK alumnus; co-founder & CEO of ARTPARK.

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Speedcubing Club

Summer Project:

- **Virtual Cube Solver:** 3x3 cube solver and NxN cube simulator created using C++ and Java Processing respectively. This is being further worked on by secretaries.

Events:

- Introductory session conducted online for Y21 by secretaries. Around 15 students attended.
- Organized a 3x3 intermediate workshop. Attended primarily by secretaries and a few other Y20 students. Covered F2L, advanced cross and a few other techniques.
- Speedy Sunday- Speedcubing competition held on 3rd October, open to all students. Had participation of around 20-25 students, with more PG participation than usual. 3x3 speedsolving, 3x3 one-handed and a mystery event conducted with the help of all secretaries.
- Conducted a watch party of a speedcubing documentary on our discord server, around 15-20 students attended the event.

Social Media:

- Post summarizing this year's summer project, along with a demo video and link to the project code was released.
- Post with highlights of Speedy Sunday released as well.
- Blog series 'Algos for Pros' started- 2 blogs have been released regarding less known but useful algorithms for the 3x3 cube.

Others:

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- Club inventory was expanded- around 25 puzzles of various kinds were ordered, along with timers and a display for competitions. Aluminium box purchased as well to store inventory
- Significant development is done on the club website- about page, team (list of coordinators and secretaries), gallery, etc.
- Progress made in the completion of the virtual cube solver and simulator that was started in the summer project of 2021.

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SOCIETIES

Brain and Cognitive Society

Summers:

- Summer projects: Conducted 7 projects in the domain of ML/AI, NLP, RL, CV, neuroscience, etc. 83 students successfully completed the projects. Details can be found here: [Projects | BCS @IITK](#)
 - Analysing Steinmetz dataset to find the role of the Hippocampus in Decision Making.
 - Finding a correlation in color-perception MRI studies and deep neural network features
 - Why would you do that?
 - Models of Memory
 - How can I explain this to you?
 - Speech Emotion Recognition
 - Convolutional Network for Online Video Understanding

Odd Sem and Winters:

- Online Documentary Screening: Screened a documentary, "In Silico", which documents a neuroscientist's often frustrating 10-year quest to simulate the human brain on supercomputers.
- Secretary Orientation and selection: Included paper presentation covering various domains related to neuroscience. 14 presentations submitted.
- Brain-Computer Interfaces: A Journal Club Event
- Introduction to Neuroscience, AI and Psychology: Y21 Orientation
- Blog Post Series: Overview of various topics and Brain related interesting Papers. 2 Published, 4 completed.
- Internally worked on Neural Latents Benchmark, which could not be submitted since the deadline was quite close to campus shifting and omicron surge. Planning to work on a report on this.

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Design & Construction Society

Summer Projects:

- **Cadalysis:** Designed the barrel of a rifle from scratch using AutoCAD and optimized the design through static and thermal analysis using ANSYS.
- **Structure Super Combo:** Analysed structures, particularly Beams, Trusses, Frames and their combination and design structures that are externally and internally stable on the finite element software SAP2000

Lectures:

- **Introductory Session for Y21:** We detailed the domain we are interested in and the former projects that we organised in the previous summers in an inaugural lecture to give an introduction to society to freshers.

Workshops:

- **SAP2000 workshop:** Held a two-day session in which we explained the fundamentals of trusses and beams and then designed and analysed a beam construction using software to ensure its strength and stability.

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Game Development Society

Summer:

- Summer Projects: Conducted 4 Semester Projects as part of the SNT Semester Project 2021. More than 100 mentees started the projects with final submissions by 70+ mentees.
 - **Intro to Gamedev:** Teaching about the basics of Game Development in the Unity game engine. Mentees were given a role from Programmer, Artist and Designer. They were divided into 8 teams to create a complete game from scratch.
 - **Intro to 3D Modelling:** Teaching about the basics of 3D Modelling in Blender. Covered various topics such as vertex editing, modelling, sculpting, texturing, shading, animation, etc.
 - **Intro to Game Design:** Teaching about the basics of Game Design. Covered topics such as General game design, Systems design, Level design, Narrative design, etc.
 - **Advanced Game Development:** Offered to those with some initial skills in Gamedev. The members were grouped into a team to make a complete game in the Unity game engine.
- Organized "Summer Game Jam 2021" which was a 7 Day Game Jam with final submission by 4 teams.

Odd Semester:

- Events:
 - Hosted workshop on "Intro to Game Programming" using the Godot game engine. The workshop was attended by an average of 70+ participants.
 - Hosted workshop on "Procedural Generation in Video Games" on ShaderToy using GLSL programming language. The session was attended by an average of 40+ students.

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- Organized “Fall Game Jam 2021” during the mid sem break with final submissions by 7 teams.
- Organized workshop on “Basics of Pixel Art” using Adobe Photoshop. The session was attended by an average of 45+ students.
- Held an introductory lecture on “Intro to Game Design and Level Design” attended by 30+ students.
- Socials:
 - Restarted “Render Mondays” on the Facebook Page with 1-2 renders posted every week.
 - Created our Instagram Page to host the weekly Render Mondays and also posts about various events.
 - Created a Youtube channel to host recordings of all the future club events and for streaming events starting with “Intro to Game Programming”.
 - Regular enhancements and bug fixes to the club website with 2 secys working part-time.
 - Published Summer Game Projects on Itch.io and Google Play Store. Currently, we have only released a single project and hope to release more in the future.
 - Article published on the club website for Summer Game Jam 2021 detailing the development process of the games made.
- Projects:
 - Organized the Basic Training Boot Camp for our 25 secys and 1 contributor teaching them about Game Development through meets and training docs.
 - Started Specialization training for the following roles:-
 - Major Roles:- Programmer, Artist, Game Designer
 - Minor Roles:- Tools Programmer, Sound Designer, Graphics Programmer
 - Created 4 Development Teams from the Secys and started internal Projects
 - Organized the 3 staged secy projects. Published 12 Games on Itch.io as part of the projects. (3 projects * 4 teams = 12)

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- Started collaboration with the Anime Society to create a Pokemon Rom Hack. The collaboration will run till the end of Even Sem.
 - Current plans are to release a small project in the odd semester to gauge our skills. The project is still underway.
 - A bigger project will be developed in the Even sem. The theme and plot are yet to be decided.
- Competitions:
 - Registered for “Build your own game” (BYOG) Jam 2021 which took place from 22nd of Oct with results being released during IGDC 2021
 - Participated in a team of 9 members making a game in 48 hours.
 - Registered for Indian Game Developers Conference(IGDC) 2021 which will take place virtually from the 16th of November. This will act as a starting off point for our networking goals in the Gamedev industry in India.
 - Received an invitation to join the Game Developers World Championship(GDWC) based on the performance of our game, “Territorial Attack” released on the Play Store.
 - The deadline for game submission is the 31st of Dec and we will spend the months of November and December on this project. The project is in the design phase and we will continue in the even semester.

Winter:

- Events:
 - Organized an Introductory lecture on Gamedev for the Y21 freshers. Attended by an average of 130+ students.
 - Held a 2-day workshop on the “Unity Game Engine”. Each day, the students were divided into 5 groups where they worked on the implementation of “Portal Breakout”. 100+ students were part of Day 1 and 75+ were part of Day 2.

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- Socials:
 - Formulated a new skill tree for the various paths of Programmer, Artist and Designer.
 - Articles are to be published on the website.
- Projects:
 - Started the design process for 2 projects.
 - A multiplayer top-down shooter project.
 - A light-based puzzle game
 - The projects are in the prototype phase and will be finished by the end of the Even Sem

Even Sem:

- **Events:**
 - Organized an **Intro to Art in Games** workshop for the Y21 batch based on Blender which was attended by an average of 70+ students.
 - Held an **Intro to Game Design Lecture** for Y21 with topics regarding general design, game feel, level design, etc. which was attended by an average of 60+ students.
 - The **Intro to Computer Graphics** workshop was held offline in L3 on shdr.bkcore which saw participation from the Y20 batch with an average strength of 45+ students.
 - **Respawn Game Jam** was held in April as our flagship event.
 - Held a nation-wide Game Jam as a collaborative event with **Coding Club, IITG** and **Computer Graphics Society, IITKGP**.
 - A team of over 50+ students oversaw the event with 9 members from the 3 IITs acting as the Core Team.
 - The Core team oversaw divisions such as:-
 - **PR**
 - **Workshops**
 - **Video Editing**
 - **Content Design**

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■ **Social Media + Discord**

- The Work done by each division was as:-
 - The PR team contacted over **400+ colleges** all over India to promote our event. The event's posts saw an average reach of 9000+.
 - The Workshop team created over **10 workshops** on topics such as Coding in Unity, 3D Modelling in Blender, Pixel Art, UI, Post processing, etc.
 - The Video editing team edited these 1-2 hour sessions into videos of 0.5 hours and these were uploaded on the game jam's youtube channel.
 - The Content design team worked on creating 10 posters and posts for our social media handles on FB, Insta, LinkedIn and Discord.
 - A game jam specific discord server was created for the game jam allowing for collaboration between the teams. The server now has over 250+ members. The social media team was responsible for moderating the fb, insta, linkedin and discord handles.
 - Our Itch.io page for the game jam saw registration from 160+ teams. We also saw participation from international participants from countries such as France and Brazil.
- Prizes worth Rs. 15K will be distributed to the members of the top 4 teams. The teams were selected based on community voting and voting by the judges. The teams will also be given certificates with signatures from all the 3 IITs.
- Merchandise such as T-Shirts/Hoodies will be given to the core team members and the secys.

● **Socials:**

- The Itch page of Studio Centauri was updated to include projects developed during the summer projects, projects

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developed by secys and project submissions in game jams created by students as part of campus game jams.

- Created an archive of books for topics regarding Game Design, Computer Graphics, Game Engines and Art in Games.

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IITK Consulting Group

Projects:

- Google AI4SG: App work ready, team to visit Patna on 14th and 15th April to meet with CARE India individuals and Bihar Government for on-ground deployment. MOJA Project complete, team gearing up to present.
- NGOs: Project with CRY and Navjyoti Foundation complete, final documentation being prepared by respective team members. Project with ATMA Consulting is also in the works. Other minor projects also in progress/complete.
- Startups: Project with Foyer Inc. and Zivov Health complete. Foyer Inc. - Product & Strategy Work Zivov Health - Data Science and ML Work
- New Work (Will continue into next tenure): Projects procured with Wikimedia Foundation, Ministry of Education and RTIwala with teams prepared and Memoranda of Understanding signing phase on. Work shall start post endsems.

Product Group Developments:

- Formed an internal product wing in the group in collaboration with 2 Y18s and other alumni actively working in Product Management.
- Launched the Product Practice Program aimed at students preparing for the placement season. Worked out all the logistics for the program, got on board a team of mentors working in the industry and program launch in the pipeline.

Secretaries and Campus Engagement:

- Case Study Competition for freshers conducted and winners announced.

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- Instagram Page launched with regular case study and analysis publications.
- Successfully conducted the Introduction to Data Science Session with a footfall of over 200 participants and positive feedback.
- Alumni Database ready; will use in upcoming months to invite speakers to come in and share their experiences through their journey in consulting and MBA.
- Planning Consult/PM event for SnT Code 2022.

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Science CoffeeHouse

Summer:

- Summer Projects
 - Modelling Incentives through Computer Sciences
 - Introduction to Immunology
 - Spinning our way through Spinors
 - What can Quantum Computers compute?
- Reading Groups
 - Well-Tempered Readers
- Talks
 - Qudits: Vatsalya Srivastava (University of Edinburgh)

Semester:

- Website development and maintenance
- Talks by students
 - Polynomial Methods in Complexity Theory
 - Udit Narayan Pandey Y19
 - Constructing rational distance sets on Parabola
 - Sayak Bhattacharjee Y19
 - Applying Variational Principle to Quantum Calculations
 - Pranjal Praneel IITK Y19
 - Conformal Groups and Boundaries
 - Rijul Tandon Y17 and Suprateek Das Y17
 - Alternating Sign Matrices and related combinatorial objects
 - Farzan Byramji Y18
- Competitions
 - Elucidate (Y21)
 - 6 Entries
 - Uploaded to Youtube
- Updation of Website
- Stream Session

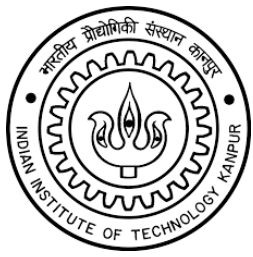
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- The Most Unknown
- 60+ participation

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TEAMS

Aerial Robotics

Induction Y20

- Lectures and assignments for new recruits equipping them with the following skills:
 - ROS
 - OpenCV
 - Simulation softwares
 - CMAKE
 - Github, git
 - C++ (OOP and STL)
 - Basics of Hardware, Blender, AutoCAD
 - Other utilities
- Simultaneously Y19s worked on documenting, and managing the work done by heads in their tenure as Junior Members of the team:
 - InterIIT Techmeet 9.0 work
 - SLAMBook study
 - Lecture and Assignment material prepared for future use as well
- Mini Projects:
 - Built upon the previous iterations of mini-projects with the addition of a new one, all designed with the purpose of giving the new recruits project experience and an opportunity to use the software tools and utilities learnt during induction.
 - Regular work/doubt sessions with Y20 to guide them through these projects.
 - Introduction of FSM based pipeline and construction of github repositories with respect to the team's guidelines.
 - Maintenance of encountered errors and their solutions in issuebook (<https://github.com/AerialRobotics-IITK/issuebook>)

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Ongoing and Completed Projects

- Swarm
 - The objective of this project was to design an algorithm to navigate an obstacle field as a swarm of UAVs while keeping the initial formation
 - Implemented a potential based formation stabilizer to maintain the initial formation
 - Modified the algorithm to make space for including/excluding any UAV into/from the swarm
 - Implemented a basic obstacle avoidance system using the potential energy method to avoid simple obstacles
 - Repo: https://github.com/QuantuMAtharva/Swarm_ARIIITK
- FPV Drone Racing
 - A drone must autonomously complete a known race track by passing through the frames using onboard sensors only
 - Used monocular camera, basic estimation, and trajectory to pass through the frames.
 - Experimented with techniques for detecting frames using colours and estimating positions.
 - Explored the use of PCL for possible extensions for segmentation and estimation.
 - Repo(s): <https://github.com/Jadit19/FPV-Drone-Racing>, https://github.com/27-JayaGupta/FPV_RandomTeam/tree/personal_branch
- Tracking
 - The main aim of this project is to track the object using drone autonomously using openCV trackers like KCF and CSRT.
 - Tested and benchmark openCV trackers on the basis of partial occlusion, complete occlusion, fps, similar objects, fast moving objects etc.
 - Implemented an algorithm to find the pose of tracked object in world frame using monocular, downward facing camera.

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- Repo : <https://github.com/ujwaljp/Tracking>
- Map Generation
 - The main aim of this project was to generate a 2D map of a given world in gazebo simulation environment.
 - Created a custom gazebo world consisting of mazes and other objects, wrote a module capable of locally storing the images of the world taken by the drone at a certain interval of time.
 - Used `rotors_simulator` and `mav_trajectory_generation` repo to create a survey routine
 - Wrote another module that is capable of stitching the images stored and generated a map of the area.

Competitions:

- SUAS 2022
 - Problem Statement Discussion
 - Modularize the whole mission in the following submodules to work upon :
 - Trajectory estimation + Obstacle Avoidance (https://github.com/PratyushGupta0/learning_experiences)
 - Detection modules
 - Simulation Tools
 - Map Generation
 - Frequent discussion was done related to algorithms but nearing Nov mid, plan was abandoned due to insufficient funds for the already high registration fees and no foreseeable access to our hardware.
- Inter IIT Tech Meet 10.0 Prep
 - Exploring following repositories and making them ready to use :
 - Surveillance/Exploration :
 - FUEL (HKUST) : integrating MPC controllers with kinodynamic planning and extending the use to `rotors_simulator`

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- mav_active_3d_planning : testing out use for autonomous exploration based tasks
- Localization -
 - Okvis : Extending for use with real-time simulation
- Mapping - MapLAB, cblox, voxgraph
- Obstacle avoidance -
 - 3DVFH (PX4-Avoidance): Local planner of this repo is ready to be tested on custom environments, but there are still some issues with global planner.
 - Teach-Repeat-Replan (HKUST): Ready to be tested for drone racing applications.
 - mit-acl/panther: Built the repo but having issues with launches due to errors in a dependency casadi. Currently trying to resolve those errors.
- Inter-IIT Tech Meet 10.0 (Mar '22):
 - Work done on the PS by DRDO - UAV guided UGV navigation on mountain road:
 - Custom depth-based road segmentation algorithm using 3 dimensional pointclouds was developed to aid in mapping the mountain road.
 - Pipeline for communication between the UAV and UGV was setup to ensure proper traversal of the road by UGV to integrate a control system for the UGV based on visual feedback from the overhead drone.
 - Secured bronze medal in the event with our computationally efficient system of road traversal with feedback from the drone.

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AUV

Software

- Training sessions and assignments were given to the new recruits to build a basic understanding of the various concepts involved in Navigation, Controls and Computer Vision.
- The software team was divided into three subteams each containing 2-4 members and specialised tasks were assigned to each subteam.
- The navigation team has completed the implementation of FastSLAM and is currently testing it on various datasets. Research papers for further
- The controls team has been researching RL based control algorithms and Fuzzy Logic based tuning methods for our already developed Cascaded PID controllers.
- The vision team has completed annotation of transdec dataset and started training YoloV4 architecture for object detection.
- The vision team has also completed the testing of different image enhancement pipelines and has been researching visual inertial odometry techniques.
- To keep the team up to date we conduct regular subteam meetings (twice a week) and software team meetings (biweekly) asking for updates in the form of presentations.
- Future Direction
 - Master Layer code for tasks specific to the competition.
 - Hardware Integration packages

Electrical:

- The batch of Y20 was trained for using multiple softwares like Matlab, Simulink, Ki cad and LTSpice.
- The development and design of a new microcontroller board has been completed.

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- Future Direction - Fabrication and testing of all the components made in the last couple of years.

Mechanical:

- Training Y20 in CAD designing in Solidworks, and performing analysis in ANSYS.
- The main hull was shrunk along with all components to be attached to it, like camera casings, to correct its big size, and account for extra buoyancy.
- Made mounts for following components- marker dropper, grabber, pathfinder.
- Stand design was modified, so that it no longer needs to be bolted on to the bot (more convenient this way).
- CAD of a new coil gun mechanism for torpedo was made, now analysing its manufacturing, working (electrical) aspects.
- Members were asked to read papers of 6 well performing teams in robosub mechanical-wise, discussing ideas from them, which can be incorporated into ours. Examples include- grid for metal base, linear actuator for grabber.
- Current Work- Designing racks for electrical components to be placed inside bot and implementing heat, thruster analysis, and motion studies in VREP.

Business:

- The business team has completed the design and printing of the new t-shirts for next year.
- The licenses for softwares like Solidworks and ANSYS have been renewed.
- The website has been updated with recent achievements and new team members

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SCIENCE AND TECHNOLOGY COUNCIL

ERA

Council project

- Dexter, a project under Science and Technology council, successfully reached its first stage of development in November.
- It is a prototype robot made from scratch whose chassis is designed so well that it can be used to carry loads in warehouses.
- Further, the robot is highly customizable and thus can be used for research purposes by attaching various accessories on its top layer.
- It is a low cost holonomic terrestrial robot whose parts are easily available in Indian Market. We are planning to make it a well designed product and launch it in Indian Market.
- The project gave a good learning experience to the new students in our team where they built and implemented the following:
 - CAD designing
 - Designing of Battery Management System
 - Designing of Power Management System
 - ROS implementation
 - Microcontroller programming

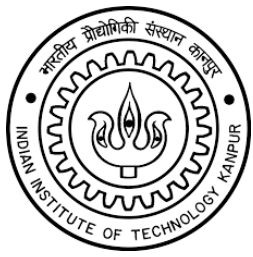
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Competition:

- RMAI Challenge
 - The problem statement for the 2022 version of the challenge had several challenges which we overcame by deploying vision based localization, enhancing the shooting pipeline using convolutional neural networks for armor plate detection and classification.
 - We are presently working on the sentry system module to localize enemy bots in the arena.
 - With these improvements we submitted the proposal for the challenge for which we have received the grade - B. We hope to outperform ourselves in the technical report to be submitted in April.

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Humanoid

Projects:

- Sim. Stabilization
 - Automi designed on Inventor and URDF file imported
 - Entire description, with sensors and meshes ready
 - Simulation unstable. Lots of jittering, increases to unworkable level
 - Port all modules on this once stable
- Pneumatic Biped
 - Working on building & manufacturing of an adult sized robot (size > 100 cm), so that we can participate in adult category of the competitions.
 - We are developing the mechanical design for the same from scratch for the project.
 - The project consists of two parts:
 - Design & analysis of the biped
 - Manufacture of the biped prototype
 - This was the ball & stick model of the scaled model of the robot.
- Path Planning
 - Path planning module of our navigation stack.
 - Aim: Get desired angle to move the bot in.
 - Based on Obstacle Detection Gaussian Potential Field (OD-GPF) method.
 - Attractive potential towards the goal
 - Lots of prototyping on Ground Vehicle Husky Bot.
 - Once prototyping successful and automi bot simulation stable, move to automi bot.
 - Plan: Using stereo cameras (logitech c270) as sensors. Obtain Depth Map and obtain obstacle potential field accordingly
 - Current Situation: started with some simple python prototype, now working with husky and LIDAR to get range data.
 - Pretty wobbly right now, refine before moving to Automi

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- Once ported to Automi successfully, use the already built step planner to locomate in the returned angle
- Terrain Estimation
 - Bunch of modules to fairly accurately understand the terrain of operation
 - Extremely important for a biped given its proneness to instability
 - Current projects:
 - Ground Plane detection Module
 - SLAM Module
- Grasping
 - Aim: Obtain optimal grasping point to pick up objects
 - The points that provide the stablest grasp. Important for competitions such as basketball
 - Once points obtained, plan trajectory for end effector. Work simultaneously being done
 - Current Methodology: Obtain Point Cloud through cameras.
 - Segmentize the concerned object e.g. a ball
 - Find corresponding points in Point Cloud
 - Complete object point cloud using an assumed plane of symmetry
 - Pass a horizontal plane through COM and obtain some grasping points
 - Once grasping points obtained, input as target position to end effector trajectory module
 - Trajectory module also under progress
 - Inputs joint angles over time to move end effector from point A to point B with a desired end point orientation

Target Competitions:

- RoboCup Humanoid Soccer Competition
 - Problem Statement:
 - Field a fleet of 5 bot. One team against another.

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- Various sub-leagues: Penalty Shootout, Passing etc
- Team with single bot, paired up with another team
- Details:
 - Target: 2023 edition
 - Prepare and submit video demonstrating basic bot capabilities
 - Prepare documentation of bot description, algorithms to be used etc.
- RoboCup Humanoid Open Soccer Competition (HOSC)
 - Problem Statement:
 - Field a fleet of 5 bot. One team against another.
 - Various sub-leagues: Penalty Shootout, Passing etc
 - Team with single bot, paired up with another team
 - Details:
 - Target: 2023 edition
 - Prepare and submit video demonstrating basic bot capabilities
 - Prepare documentation of bot description, algorithms to be used etc.
- FIRA HUROCUP 2022
 - Problem Statement:
 - Various sub-tasks: Marathon, weight lifting, archery etc
 - Details:
 - Participated in 2019 competition
 - Target: 2022 edition
 - Prepare and submit video demonstrating basic bot capabilities
 - Prepare Team Description Paper which encompasses all aspects of a team
 - Plan to participate in adult size category in future

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- International Competition of Autonomous Running Robots 2022
 - Problem Statement:
 - 3 sub-leagues in 2021 edition:
 - Treasure-Hunt
 - Sprint
 - Rescue Mission
 - Details:
 - Held in Beijing every year. Open to international teams
 - Held by Tsinghua University
 - Registration opens in March 2022

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IITK Motorsports

Competitions

- Formula Bharat Virtuals 2022
 - The purpose of the Virtuals at Formula Bharat (FBV) event is to provide teams who are either building a new formula Student team or switching to a new class or unable to build a vehicle for the season, to participate in a formula student event in the season.
 - We ranked 3rd in Rulebook Quiz for Formula Bharat Virtuals 2021. Rulebook Quiz is an elimination round.
 - 8th Overall
 - 3rd in Business Plan
 - 10th in Engineering Design
 - Rev it 2022: Reached Semifinals among 64 teams
- InterIIT Techmeet 10.0
 - In March'22, a sub-team of IITK Motorsports won a Silver medal in INTERIIT Tech Meet 10.0 in JLR's problem statement (Powered bonnet for electric vehicle).

Further Progress

- In March'22 we started disassembly-assembly of our ATV. This helped Y20s to gain practical knowledge about the car and the manufacturing process.
- This exercise made our ATV fully functional and now we have a fully functional car with us.

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ViSiON

Induction of Y20

- Covered material and assignments on-
 - Basic utilities - git, bash, python
 - Computer Vision and ML
 - Path Planning
 - SLAM
 - Controls

Competitions

- To give experience to Y20s, teams of 4, were created which participated in the Micromouse Challenge by Techfest IIT Bombay.
- BARN challenge
 - We are provided with .world files for various highly cluttered indoor environments and various goal points to which the bot has to navigate to.
 - Final evaluation will be based on time taken by the robot to reach the desired goal.
 - Submission Deadline - 24th May 2022.
 - Current Progress -
 - Localization & Mapping - Baseline done, working on further improvements
 - Path planning - path planning algorithms to implement RRT and variants of RRT and compare them before implementing path planning
 - Controls : Working on Stanley control and PID algorithms

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WINGS

Outreach and Connect

- Prepared a sponsorship brochure - handbook of insightful projects & achievements of council to showcase in front of Industries
- Prepared a database containing all the projects done containing, areas of expertise, Inter-IIT achievements, competitions won, or any such accolades etc of all SNT entities

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