Student Semester -VII
Department of Mechanical Engineering
Indian Institute of Technology Patna
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Pranav Mangesh Kulkarni

Interests:
Machine learning, Automobile, Control systems, Robotics, Path planning.

Academic Chronology:

Qualification	School/College/ University	Passing year	Score	Rank
Bachelor of Technology*	Department of Mechanical Engineering, Indian Institute of Technology Patna	2012-2016 (Expected)	8.23/10 Till date	**13th** in Department
XII	Fergusson College, Pune	2011	83%	**Top 5%**
X	Janana Prabodhini Navanagar Vidyalaya, Pune.	2009	92%	**Top 5%**

***Selected through IIT-JEE with AIR of 4787 among half a million aspirants (Top 1% in country).**

Projects undertaken:

Micromanipulation of cells: Aug. 2015-Apr. 2016(Expected)
Guide: Dr.Atul Thakur, Department of Mechanical Engineering, IIT Patna.
Developed a simulation for deterministic case of and currently involved in Machine learning and path planning aspect of 'Image guided, automated, non-prehensile magnetic micromanipulation of cells' as a part of B.Tech project. The micromanipulations of cells by micro-robots in experiments can be seen here: https://www.youtube.com/watch?v=IC8uMWQ3swo

Summer research internship 2015: May 2015-Aug.2015
Guide: Dr.Kamal Gupta, School of engineering science, Simon Fraser University, Canada.
Selected at MITACS Globalink program for paid summer research internship in the project entitled 'Establishment of probabilistic framework in "Safety Hierarchy Model" of safe navigation of wheeled robot in an uncertain dynamic environment' to modify the deterministic 'SHCostmap()' algorithm for uncertainties in the environments.

Trajectory planning: Jul. 2014-Jan.2015
Guide: Dr.Atul Thakur, Department of Mechanical Engineering, IIT Patna.

- Built an optimised fast 'Time bound A* search' algorithm for spatial-temporal, physics-aware trajectory planning of USVs operating in a cluttered environments.
- The algorithm would plan the trajectory of the robot from initial to target position avoiding all static obstacles within the given time slot with the given dynamically consistent motion constraints.
- Two different approaches of the program were developed: temporal and non-temporal.
- Tested and analysed the algorithm for various cases and suitable conclusions were noted.
- Developed simple car model simulation and tested algorithm on the same for various cases.

Bio-inspired fish robot: Feb. 2015-Apr. 2015
Guide: Dr.Atul Thakur, Department of Mechanical Engineering, IIT Patna.
Generated dynamically consistent motion constraints for real size bio-inspired fish robot and tested it with the help of real time 'Time bound A*' planning algorithm for various heuristics. This bio-inspired fish robot can be seen into action here:
https://www.youtube.com/watch?v=ngXJspuCaqk

SAE Supra Dec. 2012-Sep. 2013 and Sep.2014-Aug. 2015

Guide: Dr.Manbendra Pathak, Department of Mechanical Engineering, IIT Patna.

- Head of the 'Braking system and wheels' department for design and manufacturing of a race car for national level real-size race car making competition titled 'SAE Supra' organised by SAE India.
- Team secured a rank of 21 Supra-2014 and rank of 51 in Supra-2015 in virtual round among 150+ teams.

Wireless Air Cushion Vehicle(ACV) Aug. 2013-Oct. 2013

Guide: Dr.Atul Thakur, Department of Mechanical Engineering, IIT Patna.

Developed a tele-operation controller based on Bluetooth technology utilizing Arduino with python for small sized air cushioned hovercraft in a team of four for a competition held at IIT Guwahati, India.

Android Application: Aug. 2014-Nov. 2014

Guide: Dr.Joydeep Chandra, Department of Computer science and Engineering, IIT Patna.

Involved in designing of various XML pages of an android application named 'carpool' as a part of an elective (Introduction to infotainment) project in a team of four.

Summer Industrial Internship: Jun. 2014- Jul. 2014

Guide: Rajendra P. Mahajan, Dy. G. M. projects, Mahindra vehicle manufacturers limited .

Hands on industrial experience in automobile manufacturing company 'Mahindra Vehicle Manufacturers Limited (MVML)' in the project entitled 'study and standardisation of activities of check men and repairmen'.

Skills:

- Proficient in following programming languages:
  Python (6000 lines), C (5000 lines), JAVA (5000 lines) and MATLAB (3000 lines).
- Well conversant with graph search techniques, lattice based data structures and control algorithms.
- Skilled in following engineering software:
  CAD/CAM: SolidWorks, Pro-E and AutoCAD. **CAE**: ANSYS.
- Skilled in following software: Microsoft Excel, Microsoft Word, Microsoft Powerpoint.

Additional relevant courses completed:

- Active in online learning and have completed following online courses:
  a. 'Robot Mechanics and control' lecture series (Seoul university) Jan. 2014-Jul. 2014
  b. 'CS50' lecture series (Harvard university) May 2013-Jul. 2013
  c. 'Introduction to computer science and programming using python' (MIT) Sep. 2012-Jan. 2013

Leadership, teamwork and extra-curricular:

- **Technical Coordinator** at college's techno-cultural festival 'Anwesha-2015'. Managed the sponsorships for technical section and led the team of 80+ people to successfully conduct various technical events, workshops and lecture series.
- Member of **organizing committee** at 'Anwesha-14' and at annual techno-management festival 'Celesta'.
- Keyboard player in the band 'Half step down', participant in inter-hall band competition and at 'Anwesha'.
- Active participant in multiplayer gaming competitions.

To know more in detail about my projects, please visit: https://sites.google.com/site/projectsofpranav/