



Tinkerers' Lab Report (2014)

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Mission and Vision



It is being long felt that the youngsters entering the field of engineering education in India are not as facile and deft with objects and things of everyday life as their peers from the developed countries. It has emerged that a significant number of Indian youth are not sufficiently "hands-on", and this missing ingredient often slows down the pace of technology based innovation. In an endeavour towards bridging this gap Tinkerers' Lab has been established.

Mission: The short term goal of Tinkerers' Lab is to provide an one-stop platform to the students of IIT Bombay where they can innovate and tinker.

Vision: Making Tinkerers' Lab the biggest innovation hub of India, giving huge number of technological solutions to industrial and societal problems of the country, churning out hundreds of technological patents.

Organization



Faculty Champs

Dr. Ramesh Singh
Mechanical Dept.
IIT Bombay

Dr. Joseph John
Electrical Dept.
IIT Bombay

Organization



Student Champs

**Overall Coordinator,
STAB**
Rahul Prajapat

Managers
Dewashish Kumar Dey
Manmohan Mandhana
Shyam Sunder Prasad

Conveners
Akash Kishore
Umang Chapparia
Jashan Singhal
Sumit Jain

www.stab-iitb.org/team-stab-2014/

Organization



Lab Technicians

- 1) **Arun Nair** - He is with Tinkerers' Lab from the beginning. Now, he mostly handles the paperwork related to lab. Contact : iitunniest@gmail.com
- 2) **Vinayak Shelar** - He was appointed in July 2014. He remains in the lab from 10 am in the morning to 5 pm in the evening and help students with their work. Contact : vinayak.shelar78@gmail.com
- 3) **Prasad Gore** - He was appointed in October 2014. He has night duty in the lab from 6 pm to 2 am and afterwards, sleep in the lab itself. Contact : prasadgore04@gmail.com

Projects Under Tinkerers' Lab



- Technovation(<http://www.stab-iitb.org/technovation/>)
 - Summer Technovation projects
 - Past Technovation projects
 - New projects under Technovation
- STAB Club Projects(<http://www.stab-iitb.org/>)
- Institute Technical Summer Projects (ITSP)(<http://itsp.stab-iitb.org/>)
- Department Projects
- Hobby Projects

Technovation



It is a platform where students can float their innovative ideas, get funded, find mentors, build a dedicated team and realize their dream project. It is also a platform for professors, industries, alumni and social organizations who can float projects on which students can engage and come up with engineering solutions to a plethora of problems all around us and fulfill the urgent need of innovation India is facing.

- A program under STAB where students float their own ideas and work on them
- Focus is on real life problems and projects that can lead to technical entrepreneurship
- About 50-60 students (mostly seniors) are involved

<http://www.stab-iitb.org/technovation/>

Summer Technovation projects



- Low cost CNC laser cutting and engraving machine
 - <http://www.stab-iitb.org/technovation/cnc.pdf>
- Low cost Braille Display
 - <http://www.stab-iitb.org/technovation/braille%20display.pdf>
- Tilt - Rotor for security surveillance
 - <http://www.stab-iitb.org/technovation/tilt-rotor.php>
- Circuit Testing Device
 - <http://www.stab-iitb.org/technovation/dut1.pdf>
- Ultrasonic Blind Vision Device
 - <http://www.stab-iitb.org/technovation/blind.pdf>

Pics : https://www.facebook.com/stab.iitb/photos_stream?ref=page_internal

Institute Technical Summer Projects(ITSP)



- A platform provided to the freshmen in Summer to explore the 'techie' within them
- 121 projects registered out of which 74 teams completed their projects
- Theme : Catering to social and industrial real life problems
- About 80% of the work was done in Tinkerers' Lab
- Success story covered by Insight, Campus diary (Institute magazines), Indian Express, Maharashtra Times

Institute Technical Summer Projects(ITSP)



- List of projects can be found here:
<http://itsp.stab-iitb.org/projects.php>
- 25 best project were selected to present in Tech and RnD Exposition 2014
- Some of the projects with real life application will continue work under Technovation
- Further innovative projects will be displayed at “I2 Innovation Expo” in Pune

Department Projects



- IC 211 Lab course
 - Students used Tinkerers' Lab to explore more about the things taught in the course
- EE 112 (Freshmen Course for Electrical students)
 - As there is no lab for EE 112 many students used Tinkerers' Lab to get a hands on experience on stuffs taught in the class
- EE 318 : Electronic Design Lab (EDL)
 - Many students used Tinkerers' Lab to work during night hours as WEL (default lab for EDL) is closed

Events @ Tinkerers' Lab



- **XLR8 - Remote Controlled Car Racing Competition**
 - largest competition for freshmen witnessing participation of about 600 students
 - Tinkerers' Lab used by teams to make their bots and for debugging sessions
 - Teams used RF modules made by STAB managers in Tinkerers' Lab while in previous years, RF module was procured from market

Events @ Tinkerers' Lab



- **Line Follower Competition**

- Second competition for freshmen where freshmen are introduced to arduino and basic automation systems
- Participation of 40 teams out of which 24 teams attempted the track and 11 teams completed

- **Techify your Room**

- Take-home projects which could be implemented in rooms
- Participation of 6 teams with 6-8 people in each team out of which 5 teams completed

Major Events funded by Tinkerers' Lab



- **FireHack hardware hackathon**

- 36-hour long hardware hackathon wherein participants worked on their submitted ideas to develop a prototype with a long-term aim to convert it into a product and ideas pitched to investors during the final presentation
- Turnout of 12 IIT teams and 2 non-IIT teams out of which 8 teams successfully demonstrated their work

Major Events funded by Tinkerers' Lab



- **SSTeP (Solution to Socio-Technical Problems)**
 - A week-long event with an objective of identifying the existing problems on campus and getting people started with the implementation of possible technical solutions.
 - Participation of 60 students, event starting from 24th November
 - Event witnessing collaboration of Tinkerers' Lab with Texas Instruments, Maker Fest and Humming Whale Corporations

Finances

Fund Distribution till now :

Purpose	Amount (in Rs.)
Movable infrastructure	11,50,074 /-
Non Movable infrastructure	18,82,462 /-
Equipments	25,73,285 /-
Consumable	2,66,984 /-
Technician Salary	5,09,022 /-
Total	66,48,812 /-

Finances

Possible solutions :

- Direct donation of some costlier equipment (about twice in a year) can be a solution to the settlement hassle.
- Also the managers will follow a more systematic procedure of accounting to avoid such issues in future.

Components Available

2 PCs: 24" Screen	FIX SPANNER-TAPARIA	MARBLE CUTTER [110mm]
2 PCs: 20" Screen	ADJ-SCREW SPANNER	HAND-GRINDER
1 HP printer	PIPE WRENCH[SPANNER]	HAND DRILL MACHINE
3 DSOs	BENCH GRINDER	JIG SAW[GST 85 PBE]
2 Voltmeters	BENCH-VICE [2 inches]	CHISEL-WOODEN
column drill	BENCH-VICE [4 inches]	CHISEL-METAL
Gig Saw	BENCH-VICE [6 inches]	2 CUPBOARD-GLASS DOOR
VERNIER CALLIPER - [532-120]	BENCH-VICE [8 inches]	Raspberry pi
VERNIER CALLIPER-DIGITAL	Wired Hand Drill set	Beaglebone
RING SPANNER-TAPARIA [6 to 32]	Wireless Mini Hand Drill set	Arduino uno

Components Available

Arduino Mega	DEGREE PROTRACTOR	CENTER PUNCH
BUSTARD FILE(12, 8 in)	LOCKER-8DOOR	PIN PUNCH
SMOOTH FILE(12, 8 in)	MAKERBOT REPLICATOR-3d Printer	LETTER-PUNCH SET NUMBER-PUNCH SET
TRIANGULAR SMOOTH FILE	Function Generator M2011a	Turning CNC machine
Needle file Set	CRO (2)	Screwdrivers
FEELER-GAUGE	MINI-HACKSAW FRAME	Trisquare
SCREW PITCH-GAUGE	Multimeter (2)	Wooden hacksaw frame
RADIUS GAUGE	MIRANDA DRILL SET [HSS 1/16- 1/2 inches]	HACKSAW FRAME[10-12 inches]
Hot glue gun	MINI NOSE PLIER	Milling CNC machine
Keypad	COMBINATION PLIER [8 inches]	CCTV camera

Infrastructure

- Old Tinkerers' Lab (Main Building, 3rd floor) was vacated in June and all equipment shifted to New Tinkerers' Lab. Temporary space (for storage of big almirahs of old TL) has not been provided yet
- Permission issues for extension of Tinkerers' Lab from DPC, IIT Bombay and Electrical Department, taking much time than expected

Associations



Future Plans



- Publishing online monthly progress report from now. Summarizing all reports every six months.
 - Through TL's site : <http://stab-iitb.org/tinkerers-lab/>
- Collaboration with other IIT's
 - Knowledge sharing from IIT Kanpur and IIT Madras students' labs
 - Dialogue to be initiated in Inter IIT Tech Meet 2014

Future Plans



- Resolving Funding Issue
- Resolving Infrastructural issue
- Industrial problems among students. Mentorship from various professionals like professors, alumnus and industrialists : We have come up with a robust structure for this, will be implementing it in coming semester
- Knowledge sharing help from Alumnus
 - Expertise of alumnus to be forwarded to required teams
 - A portal of Tinkerers' Lab website for the same

Thanking Note to '75 batch



We sincerely thank the alumni batch of '75 for taking a step towards improving the technical scene in the institute. We thank them not just for the funding but also for their constant support and encouragement. Without your guidance, this major step towards getting the next big innovation from India would never have become a reality.

