



# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

भारतीय प्रौद्योगिकी संस्थान हैदराबाद  
Indian Institute of Technology Hyderabad



# About IIT-H



*Kandi (permanent) campus*



- Started in Aug 2008
- Ph.D program in Jan 2009
- M.Tech program in Aug 2009
- 14 Departments covering all major engineering, sciences and humanities
- BTech, MTech, MDes, MPhil, MSc, PhD degrees offered

- More than 2150 students – 862+ BTechs, 448+ MTechs, M.Des 32, 8 MPhil, 108 MSc, 668+ PhDs
- Effective Oct 2015, functioning from the permanent campus

*Next phase of buildings coming up*



# Programs Offered @ CSE

B.Tech (Computer Science) started in 2008

M.Tech (Computer Science) started in 2010

Ph.D (Computer Science), started in 2009

Executive M.Tech in Data Science, started in 2015

- A unique online program for working professionals

## Other

- B.Tech (Engineering Sciences)
- Popular Minor & Double Major for students from other streams
- CEP Certificate Courses on Foundations of Predictive Analytics & Big Data Analytics for Industry/Academia



# Department Strength

## Students

- B.Tech: 176
  - M.Tech: 103
  - Ph.D: 52
- Total: 331

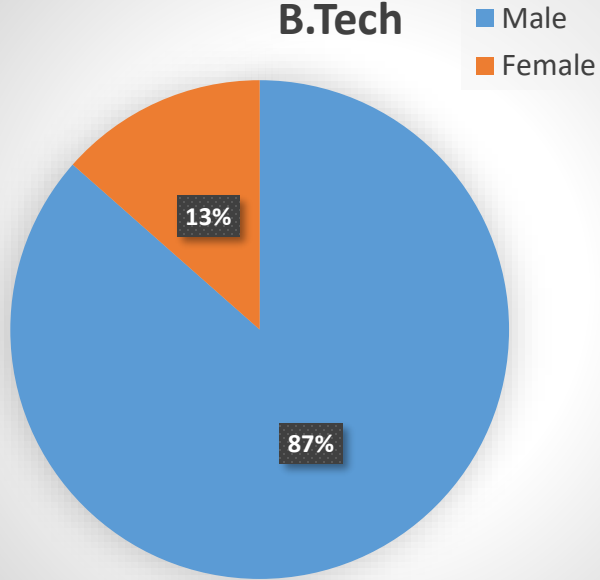
## Faculty

- Regular: 17 (5 Associate & 12 Assistant Profs)
- Adjunct: 1

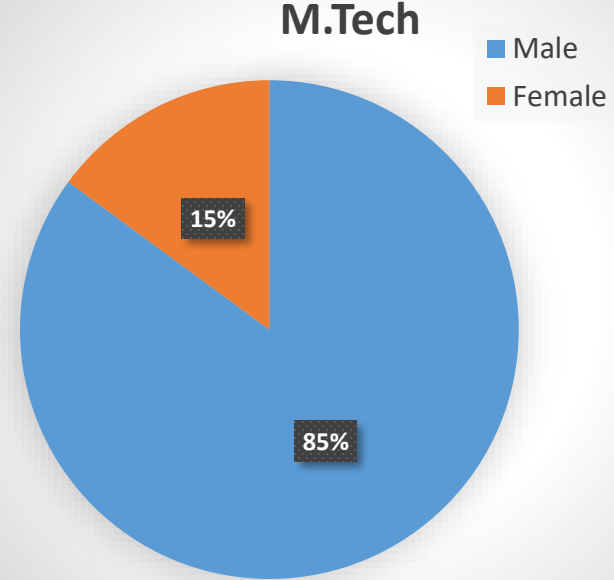


# Students diversity

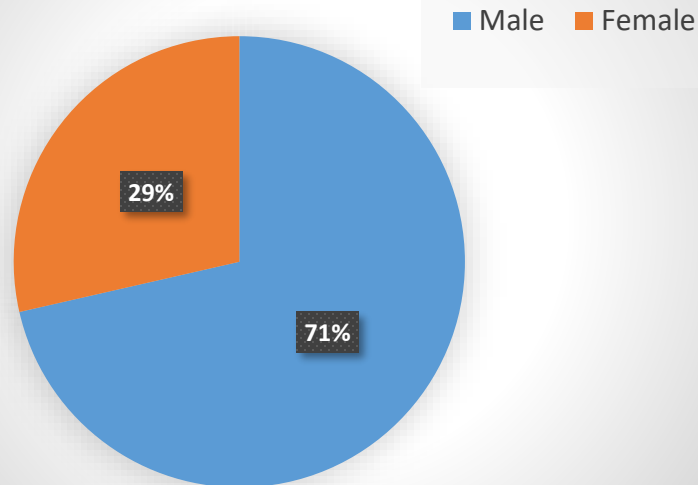
**B.Tech**



**M.Tech**

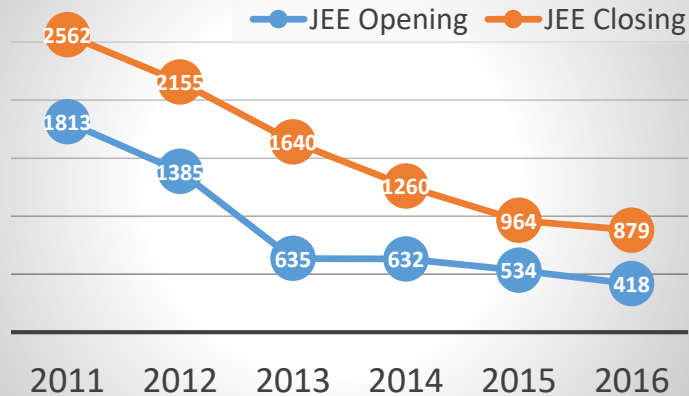


**Ph.D**

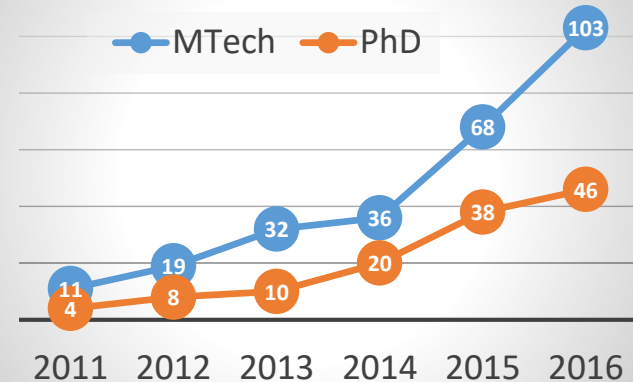


# Dept Background/Highlights

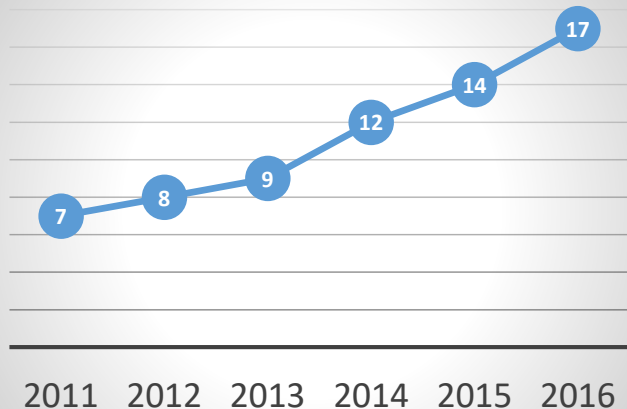
## JEE Ranks



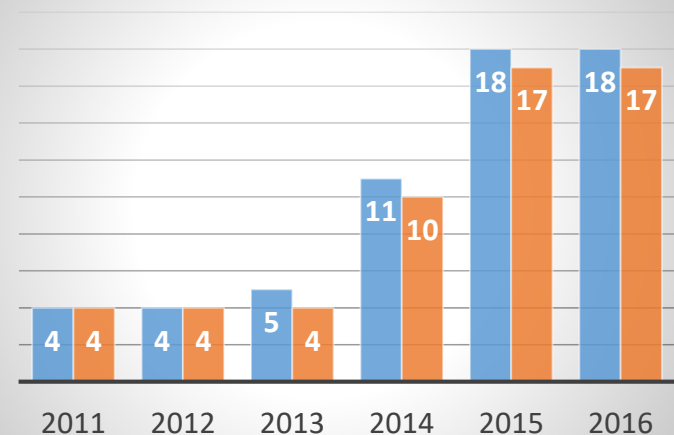
## # PG Students



## # Faculty



## # PG Placement



# Research Areas

Algorithms, Graph  
Theory, Game  
Theory

Complexity Theory,  
Quantum  
Computing

Networked  
Wireless Systems,  
Network  
Architecture

Modelling and  
Verification of  
Hybrid Systems

Video Content  
Analysis, Computer  
Vision

Machine Learning,  
Artificial  
Intelligence

Big Data Analytics,  
Large-Scale  
Machine Learning

Very Large Scale  
Integration (VLSI)

Compilers,  
Programming  
Languages

Parallel  
Programming,  
Distributed  
Systems

Databases, Data  
Mining,  
Information  
Retrieval

Human-Computer  
Interaction,  
Information  
Visualization





# Research Groups

## Networks and Mobile Systems Group (3)

- Networked Wireless Systems (NeWS) Lab
- Practical Networks (PraNet) Lab

## Data Science Research Group (7)

- Data Informatics Group (DIG)
- Visual Intelligence and Learning (VIGIL) Lab

## Theoretical Computer Science Group (4)

## Compilers and Verification Group (2)

## Parallel and Distributed Systems Group (2)

## VLSI and Computer Architecture Group (2)





# R&D Thrust Areas

Center of Excellence in Data Science

5G, IoT & Smart Commute (ITS)

Mobile Social Networks & Computing

Behavioural Data Science -- AI and Deep Learning

Data analytics for real-time security and surveillance

Computational Epidemiology

Storage and Retrieval Mechanisms

Middleware & Compiler optimization for HPC



# Common Computing Resources

- 28 high-end servers (Intel Xeon E5 Series CPUs)
- 40 Workstations
- SDN switches, Cisco routers
- 2 SAN Storage Systems (30/50 TB)
- 50 Thin Clients, 60 Desktops
- GPGPU server with 6 Tesla K20X GPU cards
- IoT & Other Equipment
  - Microsoft Surface, FireEye Programmable camera, LeapMotion Controller
  - IoT devices (Odroid, RaspberryPi) & wireless dongles
  - UHD smart TVs & smart phones



# Research Collaborations

## Industry

- KDDI R&D Labs, Japan
- Microsoft Research, Bangalore
- IBM Research, Bangalore
- AMD, Bangalore
- ANURAG, DRDO
- RCI, DRDO
- NetApp, Bangalore
- LG Soft (R&D Division of LG Electronics)
- Uurmi Systems, Hyderabad
- Samsung Research India (SRI) Delhi
- Intel, Bangalore

## Academic

- Indian Institute of Science
- Tata Institute of Fundamental Research
- University of Texas Dallas
- INRIA, Paris, France
- Tel Aviv University, Israel
- Paris Tech, France
- Eurecom, France
- Chennai Mathematical Institute
- Royal Holloway University of London, UK
- Nanyang Technological University, Singapore
- University of Tartu, Estonia



# External Funding

No. of R&D Projects Sanctioned	21 of budget approx. Rs. 17.52 Cr
No. of R&D Projects Ongoing	12 of budget approx. Rs. 12.75 Cr
No. of joint R&D Projects /w other depts & institutes	7 of total budget of approx. Rs. 81.18 Cr
No. of Consultancy Projects Sanctioned	4 of Rs. 17.8 L
No. of Computational Infrastructure Grants	2 or 2.4 Cr



# Sponsored Research Projects

Smart Cities for Emerging Countries based on Sensing, Networking and Big Data Analysis of Multimodal Regional Transport System (joint /w EE/CE depts. & other institutes in Japan)	JST/JICA SATREPS (2017-22)	38 Cr
Converged Cloud Communication Technologies (joint /w EE Dept)	Deity, Gol (2014-19)	24 Cr
Cyber-Physical Systems Innovation Hub (joint /w EE & ME Depts)	Deity, Gol (2011-16)	17.6 Cr
DISANET Group 4	JICA, SATREPS (2010-15)	2 Cr
An Efficient Software Framework for developing Reliable Multi-threaded Applications for Multi-Core Architecture (joint /w TIFR)	IMPRINT, MHRD (2016-18)	60 L
Mathematical Models & Morphological Analysis-based Algorithms for Image Comparison and Classification in Computer-based Vision System (joint /w EE Dept)	DST-RFBR (2013-14)	21 L







सत्यमेव जयते  
Department of Science & Technology  
Govt. of India





# Sponsored Projects (contd.)

Prosodically Guided Phonetic Engine for Searching Speech Databases in Indian Languages (joint /w EE Dept)	DeitY, Gol (2012-13)	60 L	 सत्यमेव जयते Government of India  सत्यमेव जयते  
Data Analytics for Security and Surveillance (2015-18)	Govt. of Telangana	20 L	
Scalable Compiler Technologies for Modern Heterogeneous Architectures	AMD (2016-17)	\$120 00	
An Efficient Software Framework for High Performance Computing Systems	BRNS, DAE (2016-18)	35 L	
Conformal Prediction for Reliable Machine Learning	DST-EPSRC (Indo-UK), 2015	10 L	
Low Latency Network Architecture and Protocols for 5G Systems and IoT	SERB-EC (2016-18)	32 L	
Deep Learning for Embedded Computer Vision	RCI, DRDO (2016-17)	10 L	
Compilation Technologies for Secure Architectures (2016-17)	ANURAG, DRDO	10 L	



# Sponsored Projects (contd.)

Architecture Design for the Control and Energy Management of an AC Microgrid (joint /w EE Dept)	Hitachi (2013-14)	17 L
Transportation Flow Modeling and Visualization for Disaster Management Applications	ANURAG, DRDO (2014-15)	10 L
An Efficient Middleware for Multi-Core Systems using Transactional Memory Systems	ANURAG, DRDO (2016)	10 L
Multi-link Communication Technology (2012-13)	KDDI R&D Labs, Japan	\$ 15000
Flight Operations Quality Assurance and Performance Optimization using Big Data Analytics (2016-18)	Honeywell	25 L



**HITACHI**  
Inspire the Next

**KDDI**  
KDDI R&D LABS

**Honeywell**

# Consultancy & Other Grants

Wireless Networks (2013-14)	Uurmi Systems, Hyderabad	7.2 L
Predictive Analytics (2014-15)	iConcept solutions	3.5 L
Deep Learning for Multimedia Analytics	Ekam Technologies, Bangalore (2016)	2.1 L
On Increasing Concurrency in Transactional Memory Systems	NetApp (2014)	5 L

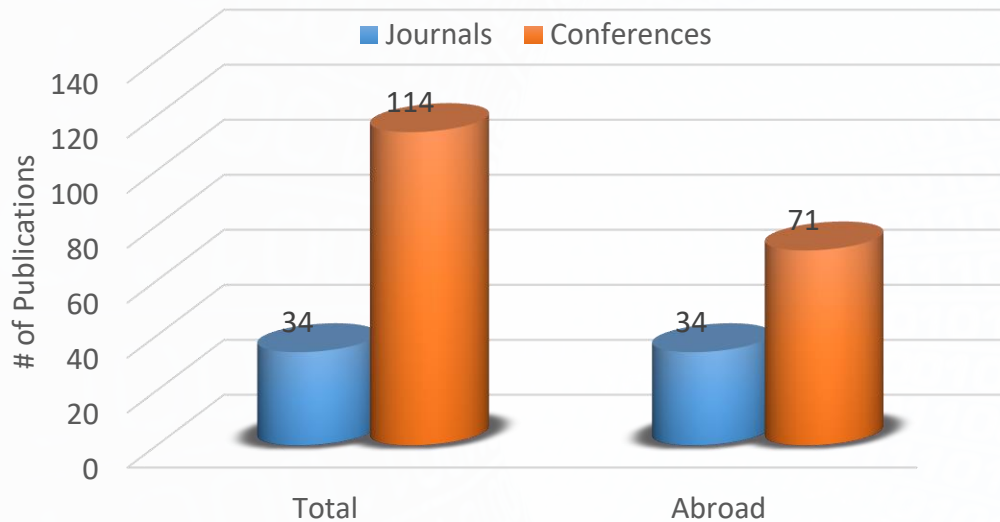


Microsoft Summer Research Internship Grant	Microsoft (2016-17)	5 L
Infrastructure Grant	DST FIST (2017-22)	2.2 Cr
e-DRIShTI: Automatic Determination of Student Engagement for Personalized e-Learning	IBM Smarter Planet Grant (2014-16)	\$6000

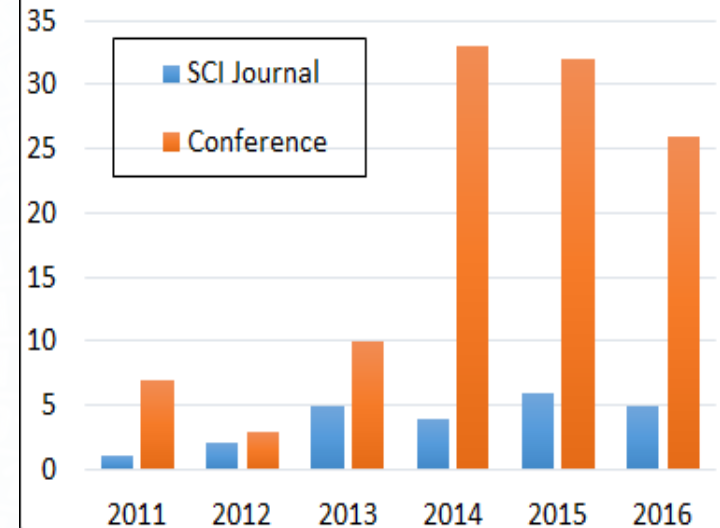


# Research Output

## Publications (2011-16)



## # Publications



Patents	4
Book Chapters	3



# Recent Achievements

## Publications in top-tier venues

- IEEE TBD'17, VLDB'16, KDD'15, IEEE TPAMI'15, PR'16, Algorithmica'16

## Best Paper Awards

- IoT workshop @ TSDSI 2016
- IEEE ICACCI 2015
- IEEE HiPC 2014
- 2<sup>nd</sup> rank in Pseudo-Boolean 2016

## Fellowships

- Intel India PhD Fellowships (2)
- Visvesvaraya PhD Fellowships (16)
- Young Faculty Fellowships (3)

## Scholarships

- Google Anita Borg Scholarship 2016
- Viterbi and SN Bose Scholarships for Summer Internships @ US Universities
- Scholarships Summer Internships @ Purdue University
- Sakura Science Plan Summer Internships @ UoT, Japan 2016
- Google Venkat Panchpakesan Memorial Scholarship 2016

# Recent Achievements

## Open-source & standardization efforts

- TSDSI, NS-3 modules, OAI 5G Software Alliance, Cache Modeling tools



## Contests

- Joint winner in Microsoft Hacking Contest, 2015
- 1<sup>st</sup> prize in Mobile and Web Application Testing, BugAthon 2015
- 2<sup>nd</sup> prize in TCS CodeVita Coding Challenge, 2015 (International)
- 1<sup>st</sup> prize in TCS CodeVita Coding Challenge, 2016
- Bronze medal at Inter IIT Tech Meet 2015 for the event Model Village



## Others

- Google Summer of Code projects, 2015 & 2016
- MoU with Hyderabad city police to enhance safety of citizens by using video analytics, 2016



# Curriculum: Standout Features

1-credit Research Internship courses from 2<sup>nd</sup> year for B.Techs

3-credit Honors and Mini-project courses in final two years

2-year regular M.Tech and 3-year research-focused M.Tech

Unique course work based Executive M.Tech for working professionals

Option to convert from B.Tech to dual degree M.Tech

Direct PhD after B.tech & option to convert from M.Tech to Ph.D





# Courses by Industry Experts



Microsoft Research



Samsung Research



Secrata (past: IBM)



Zettata (past: BolTell)



Adobe Systems



IBM IRL



Brocade (past: IBM IRL)



Allied Telesis



# New Initiatives



2015: Executive M.Tech program in Data Science for working professionals

2016: Samsung Digital Academy

2016: Mentoring IIT Bhilai

2017: Joint M. Tech program in Machine Learning



# Executive M.Tech in Data Science

- Course work based degree for working professionals
- Live video lectures, remote attendance
- 30 students per batch
- Slow paced (2-4 years)
- 24 Credits
- Assignments graded remotely
- One visit per semester



4\*4 Display wall showing instructor & active participants in a live class



# Samsung Digital Academy



SRI DELHI

- IoT and Pervasive computing courses by Samsung Research India (SRI) Delhi @ IITH
- Signed MoU on academic & research collaborations
- IoT lab setup /w budget of 20 L
- Summer internships & campus placements





# Other events





# Entrepreneurial Activities

## Three start-ups

- Plianto Technologies (<http://www.plianto.com/>) by Dr. Sobhan Babu
- StoryXpress by students
- Kaddi Labs by students

### Plianto Technologies



#### Plianto Technologies



Plianto Technologies is an ERP products development company incubated at IIT Hyderabad campus. Plianto Technologies is developing ERP products to verticals like Education and Hospitality. Main aim of Plianto Technologies is developing reasonably priced ERP products which are robust and flexible using open source technologies.

#### Contact Details

Plianto Technologies  
IIT Hyderabad Campus  
ODF Estate  
Yeddumailaram  
Medak District  
Andhra Pradesh 502205  
sobhan@gmail.com

#### How to Reach Us

We are located in IIT Hyderabad campus. For more directions visit page

It is started by people with passion for technology and rich domain expertise in areas like Database systems, Analytics, Academic administration. Currently we are concentrating on ERP products for Higher Education Sector.

### THE NEW INDIAN EXPRESS

Home > Cities > Hyderabad

#### IIT-H Students' Start-up: A 'Do-it-yourself' Model of Video Making

By J Deepti Nandan Reddy | Published: 15th March 2015 06:02 AM Last Updated: 15th March 2015 09:57 AM

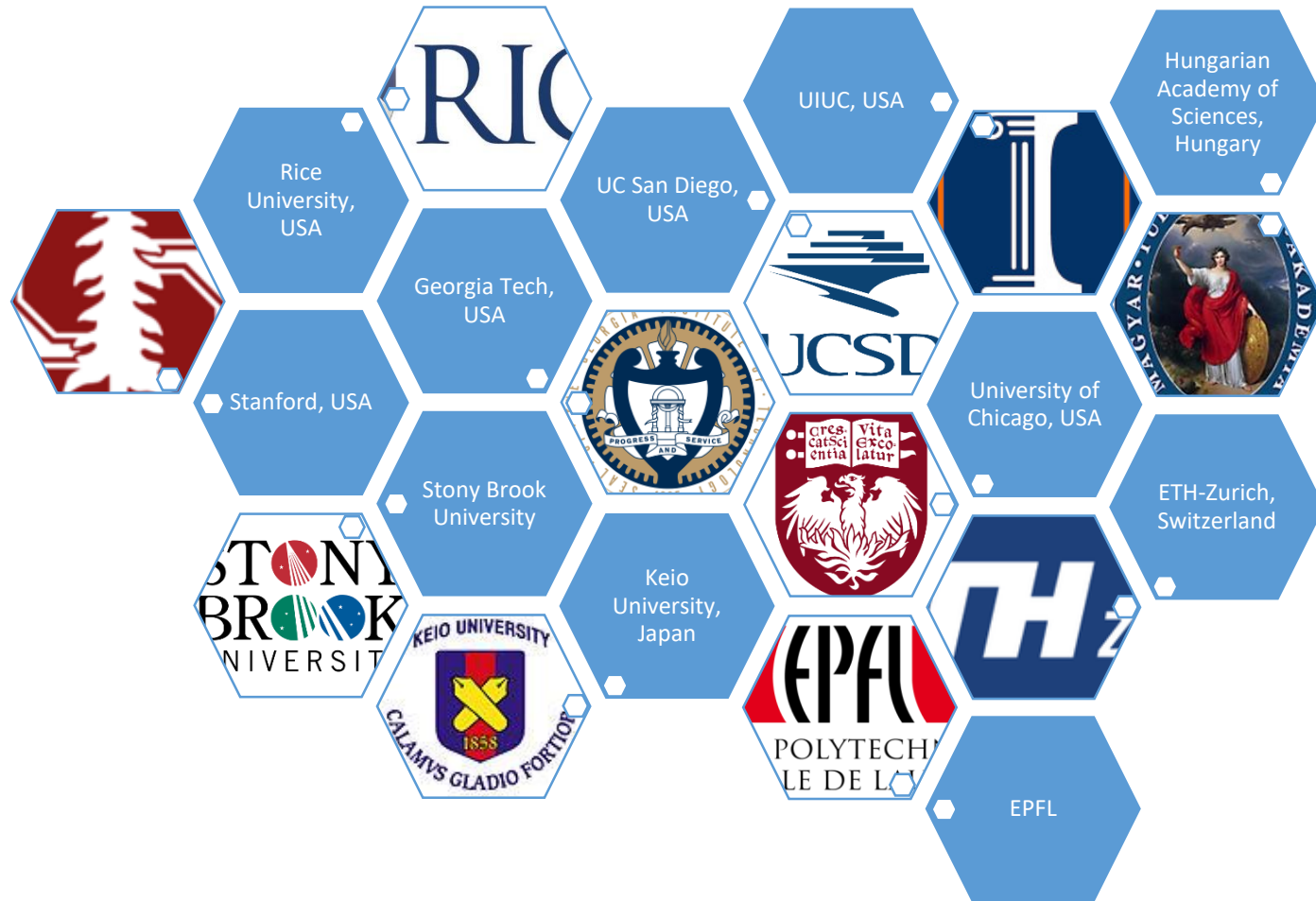
Tweet 18 Like 186 +1 0 Email 0

HYDERABAD: Shunning lucrative job offers and keeping away from campus interviews, a band of four Indian Institute of Technology, Hyderabad (IIT-H) students have embarked on the path of business and launched a start-up.

Ankit Mishra, Mudit Tanwani, Sanyam Kapoor and Chinmay Jindal have set up Storyxpress. A brand video which costs as less as five US dollars is what Storyxpress, a software application developed by them, offers. Started two years ago when Ankit and Mudit were in their third year and Sanyam Kapoor and Chinmay Jindal in the first year, Storyxpress evolved from a college startup idea to a full-fledged software application today. Storyxpress has won an award for student innovation among start-ups from the Hyderabad Software Enterprises Association (HYSEA).




# CSE graduates doing higher studies @





# Placements

	2011	2012	2013	2014	2015
<b>B.Tech.</b>		30/36	36/36	33/35	35/44 (5 – higher edn)
<b>M.Tech.</b>	4/4	4/4	5/6 (one not interested)	10/11	13/14 (1 external candidate)
<b>Package</b>	Highest: 6L p.a.	Highest: 35L p.a. (international); Highest: 19L p.a. (India)	Highest: 35L p.a. (international); Highest: 21L p.a. (India)	Highest: 22L p.a. (India)	Highest: 29L p.a. (India)
	Lowest: 4.5L p.a.	Lowest: 5L p.a.	Lowest: 6L p.a.	Lowest: 5L p.a.	Lowest: 6L p.a.
<b>Top Hiring Companies</b>	Hitachi, IBM, GE	Amazon, Microsoft, NetApp, Infosys, Cognizant, HP, Paypal, Cypress, Works Application (Japan)	Google, Amazon, Microsoft, NetApp, Works Application (Japan), Infosys, Strand Life Sciences, Qualcomm, Paypal, Morgan Stanley, Dell, Cisco	Amazon, Microsoft, Dell, StrandLife, NVIDIA, eBay, IBM, Samsung, Qualcomm, Deloitte, etc.	Amazon, Microsoft, Yahoo Japan, Google, Dell, Flipkart, Samsung, Snapdeal

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Faculty and students celebrating CSE Departmental Day, 2015

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### Events

[Invited Talk by Dr. Sunil Sherlekar on Basic Research, IP Protection & Startups: What We Should Do in India](#)

[Invited Talk by Dr. Naresh Manwani on Learning in presence of noise](#)

### News

[Applications are invited for the Summer Internship-2016](#)

[List of Candidates Selected for M.Tech \(RA\) programme through Sponsored Projects in the CSE](#)



# For updates ...



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<http://cse.iith.ac.in/>

# Upcoming CSE-EE Department Building





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