About IIT-H

- 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

- ~2350 students: 858 BTechs, 504 MTechs, MDes 32, 10 MPhil, 120 MSc, 749 PhDs
- Effectively Oct 2015, functioning from the permanent campus

Next phase of buildings coming up
Department Strength (Aug 2018)

Students

- BTech: 191
- Masters: 160
- PhD: 62
- Total: 413

Faculty

- Regular: 20 (1 full, 9 Associate & 10 Assistant Profs)
- Adjunct: 1

CSE faculty with director and other guests (Oct 2016)
## Student diversity

<table>
<thead>
<tr>
<th>Program</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Tech.</td>
<td>170</td>
<td>21</td>
<td>191</td>
</tr>
<tr>
<td>Masters</td>
<td>131</td>
<td>29</td>
<td>160</td>
</tr>
<tr>
<td>Ph.D</td>
<td>43</td>
<td>19</td>
<td>62</td>
</tr>
</tbody>
</table>
Dept Background/Highlights

JEE Ranks (General)

<table>
<thead>
<tr>
<th>Year</th>
<th>Opening</th>
<th>Closing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>635</td>
<td>1640</td>
</tr>
<tr>
<td>2014</td>
<td>632</td>
<td>1260</td>
</tr>
<tr>
<td>2015</td>
<td>534</td>
<td>988</td>
</tr>
<tr>
<td>2016</td>
<td>418</td>
<td>879</td>
</tr>
<tr>
<td>2017</td>
<td>522</td>
<td>975</td>
</tr>
<tr>
<td>2018</td>
<td>445</td>
<td>777</td>
</tr>
</tbody>
</table>

PG Students

<table>
<thead>
<tr>
<th>Year</th>
<th>Masters</th>
<th>PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>32</td>
<td>10</td>
</tr>
<tr>
<td>2014</td>
<td>36</td>
<td>20</td>
</tr>
<tr>
<td>2015</td>
<td>38</td>
<td>45</td>
</tr>
<tr>
<td>2016</td>
<td>68</td>
<td>58</td>
</tr>
<tr>
<td>2017</td>
<td>103</td>
<td>82</td>
</tr>
<tr>
<td>2018</td>
<td>136</td>
<td>62</td>
</tr>
</tbody>
</table>
Programs Offered @ CSE

B.Tech, MTech and PhD (Computer Science)

Option to get PhD degree jointly from IITH and Swinburne University (Australia)

MTech in Machine Intelligence (jointly with EE)

M.Tech in Data Science
  - 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
Funding for PhD is available thru

- **MHRD scholarship**
- **IDRBT PhD scholarship**
  - Candidate completes course-work at IITH. For rest of his/her PhD, candidate spends most of the time at IDRBT Hyd campus.
  - Academic rules and the award of degree are as per the IITH norms
  - One adviser each from IITH and IDRBT
  - Stipend and other facilities are as per IDRBT norms.

- **Project funded positions**
  - Industry-sponsored, e.g., Intel, Microsoft, SRC, TCS, etc.
  - Government-sponsored, e.g., DST, DoT
## Curriculum: Standout Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-credit Research Internship courses</td>
<td>From 2nd year for B.Techs</td>
</tr>
<tr>
<td>3-credit Honors and Mini-project courses</td>
<td>In final two years</td>
</tr>
<tr>
<td>2-year regular M.Tech and 3-year research-focused M.Tech</td>
<td></td>
</tr>
<tr>
<td>Unique course work based M.Tech</td>
<td>For working professionals</td>
</tr>
<tr>
<td>Option to convert from B.Tech to dual degree, MTech to PhD</td>
<td></td>
</tr>
<tr>
<td>Direct PhD after B.tech &amp; option to get both MTech &amp; PhD degrees</td>
<td></td>
</tr>
</tbody>
</table>
New Initiatives

- 2015: M.Tech program in Data Science for working professionals
- 2016: Samsung Digital Academy
- 2016-2018: Mentoring IIT Bhilai
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
- Autonomous driving and Computer Architecture
- 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 (5)

Compilers and Verification Group (2)

Parallel and Distributed Systems Group (1)

Computer Architecture for Machine Learning 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, autonomous driving
- Storage and Retrieval Mechanisms
- Middleware & Compiler optimization for HPC
## 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, Redpine Signals

### Academic
- IISc, TIFR, CMI, IIT Delhi/Bombay
- UT Dallas, U of Pittsburgh, Penn State U, UCSD (US)
- INRIA, Paris, France
- Tel Aviv University, Israel
- Paris Tech, Eurocom, France
- Royal Holloway University of London, UK
- NTU and NUS, Singapore
- University of Tartu, Estonia
- Mid Sweden University, Sweden
## External Funding

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of R&amp;D Projects Sanctioned</td>
<td>21 of budget approx. Rs. 17.52 Cr</td>
</tr>
<tr>
<td>No. of R&amp;D Projects Ongoing</td>
<td>12 of budget approx. Rs. 12.75 Cr</td>
</tr>
<tr>
<td>No. of joint R&amp;D Projects /w other depts &amp; institutes</td>
<td>7 of total budget of approx. Rs. 81.18 Cr</td>
</tr>
<tr>
<td>No. of Consultancy Projects Sanctioned</td>
<td>4 of Rs. 17.8 L</td>
</tr>
<tr>
<td>No. of Computational Infrastructure Grants</td>
<td>2 or 2.4 Cr</td>
</tr>
</tbody>
</table>
## Sponsored Research Projects

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart Cities for Emerging Countries based on Sensing, Networking and Big Data Analysis of Multimodal Regional Transport System (joint /w EE/CE depts. &amp; other institutes in Japan)</td>
<td>JST/JICA SATREPS (2017-22)</td>
<td>38 Cr</td>
</tr>
<tr>
<td>Converged Cloud Communication Technologies (joint /w EE Dept)</td>
<td>Deity, GoI (2014-19)</td>
<td>24 Cr</td>
</tr>
<tr>
<td>Cyber-Physical Systems Innovation Hub (joint /w EE &amp; ME Depts)</td>
<td>Deity, GoI (2011-16)</td>
<td>17.6 Cr</td>
</tr>
<tr>
<td>DISANET Group 4</td>
<td>JICA, SATREPS (2010-15)</td>
<td>2 Cr</td>
</tr>
<tr>
<td>An Efficient Software Framework for developing Reliable Multi-threaded Applications for Multi-Core Architecture (joint /w TIFR)</td>
<td>IMPRINT, MHRD (2016-18)</td>
<td>60 L</td>
</tr>
<tr>
<td>Project Description</td>
<td>Sponsor/Partner</td>
<td>Duration</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------</td>
<td>----------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Prosodically Guided Phonetic Engine for Searching Speech Databases in Indian Languages (joint /w EE Dept)</td>
<td>DeitY, GoI (2012-13)</td>
<td>60 L</td>
</tr>
<tr>
<td>Data Analytics for Security and Surveillance (2015-18)</td>
<td>Govt. of Telangana</td>
<td>20 L</td>
</tr>
<tr>
<td>Scalable Compiler Technologies for Modern Heterogeneous Architectures</td>
<td>AMD (2016-17)</td>
<td>$120 00</td>
</tr>
<tr>
<td>Conformal Prediction for Reliable Machine Learning</td>
<td>DST-EPSRC (Indo-UK), 2015</td>
<td>10 L</td>
</tr>
<tr>
<td>Low Latency Network Architecture and Protocols for 5G Systems and IoT</td>
<td>SERB-EC (2016-18)</td>
<td>32 L</td>
</tr>
<tr>
<td>Deep Learning for Embedded Computer Vision</td>
<td>RCI, DRDO (2016-17)</td>
<td>10 L</td>
</tr>
<tr>
<td>Compilation Technologies for Secure Architectures (2016-17)</td>
<td>ANURAG, DRDO</td>
<td>10 L</td>
</tr>
<tr>
<td>Project Description</td>
<td>Sponsor</td>
<td>Duration</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>Architecture Design for the Control and Energy Management of an AC Microgrid (joint /w EE Dept)</td>
<td>Hitachi (2013-14)</td>
<td>17 L</td>
</tr>
<tr>
<td>Transportation Flow Modeling and Visualization for Disaster Management Applications</td>
<td>ANURAG, DRDO (2014-15)</td>
<td>10 L</td>
</tr>
<tr>
<td>An Efficient Middleware for Multi-Core Systems using Transactional Memory Systems</td>
<td>ANURAG, DRDO (2016)</td>
<td>10 L</td>
</tr>
<tr>
<td>Multi-link Communication Technology (2012-13)</td>
<td>KDDI R&amp;D Labs, Japan</td>
<td>$ 15000</td>
</tr>
</tbody>
</table>
## Consultancy & Other Grants

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Principal Investigator</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless Networks (2013-14)</td>
<td>Uurmi Systems, Hyderabad</td>
<td>7.2 L</td>
</tr>
<tr>
<td>Hardware architectures for autonomous driving</td>
<td>SRC USA (2018-2021)</td>
<td>$36000</td>
</tr>
<tr>
<td>Deep Learning for Multimedia Analytics</td>
<td>Ekam Technologies, Bangalore (2016)</td>
<td>2.1 L</td>
</tr>
<tr>
<td>On Increasing Concurrency in Transactional Memory Systems</td>
<td>NetApp (2014)</td>
<td>5 L</td>
</tr>
<tr>
<td>Microsoft Summer Research Internship Grant</td>
<td>Microsoft (2016-17)</td>
<td>5 L</td>
</tr>
<tr>
<td>Infrastructure Grant</td>
<td>DST FIST (2017-22)</td>
<td>2.2 Cr</td>
</tr>
<tr>
<td>e-DRIShTI: Automatic Determination of Student Engagement for Personalized e-Learning</td>
<td>IBM Smarter Planet Grant (2014-16)</td>
<td>$6000</td>
</tr>
</tbody>
</table>

See [https://cse.iith.ac.in/?q=Projects](https://cse.iith.ac.in/?q=Projects) for full details
Recent Achievements

Publications in top-tier venues


Best Paper Awards

- IoT workshop @ TSDSI 2016
- IEEE ICACCI 2015, IEEE HiPC 2014
- 2nd rank in Pseudo-Boolean 2016

Fellowships/ Early-career research (ECR) award

- Intel India PhD Fellowships (3)
- Visvesvaraya PhD Fellowships (16)
- Young Faculty Fellowships (3), ECR awards (4), INSPIRE faculty award

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, 2017, 2018
- Google Venkat Panchpakesan Memorial Scholarship 2016
Recent Achievements

Open-source & standardization efforts
- TSDSI, NS-3 modules, OAI 5G Software Alliance, Cache Modeling tools

Contests
- 1st and 2nd prize in incomplete weighted MaxSAT in MaxSAT evaluations 2018
- Joint winner in Microsoft Hacking Contest, 2015
- 1st prize in Mobile and Web Application Testing, BugAthon 2015
- 2nd prize in TCS CodeVita Coding Challenge, 2015 (International)
- 1st prize in TCS CodeVita Coding Challenge, 2016
- Bronze medal at Inter IIT Tech Meet 2015 for the event Model Village

Others
- Hosted NCC 2018
- Google Summer of Code projects, 2015-2018 (to multiple students)
- MoU with Hyderabad city police to enhance safety of citizens by using video analytics, 2016
M.Tech in Data Science

• Course work based degree for working professionals
• Live (synchronous) video lectures, remote attendance
• 35 students per batch
• Slow paced (3-5 years)
• 48 Credits (equivalent to regular MTech)
• Assignments graded remotely
• One visit per semester

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

<table>
<thead>
<tr>
<th>Year</th>
<th>B.Tech.</th>
<th>M.Tech.</th>
<th>Package (per annum)</th>
<th>Top Hiring Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>33/35</td>
<td>10/11</td>
<td>Highest: 22L; Lowest: 5L</td>
<td>Amazon, Microsoft, Dell, Strand Life, NVIDIA, eBay, IBM, Samsung Deloitte, etc.</td>
</tr>
<tr>
<td>2015</td>
<td>35/44 (5 - Higher education)</td>
<td>13/14 (1 external candidate)</td>
<td>Highest: 29L (India); Lowest: 6L</td>
<td>Amazon, Microsoft, Google, Dell, Flipkart, Samsung, Snapdeal</td>
</tr>
<tr>
<td>2016</td>
<td>40/44</td>
<td>17/18</td>
<td>Highest: 35L</td>
<td>Yahoo Japan, Murata, Hikari Tsuchin, Qualcomm, Securifi, UHG, Paypal, Practo, Deshaw, Dell, Walmart, Paypal, Oracle, Honeywell, Bank of America,</td>
</tr>
<tr>
<td>2017</td>
<td>35/43 (3 - higher education)</td>
<td>13/13</td>
<td>Highest: &gt;30L; Lowest 6L</td>
<td>Rakuten, Amazon, Qualcomm, Oracle, Samsung, Walmart, Mathwork, Dell, Microsoft, Deloitte, Adobe Systems, Yahoo Japan, PayPal, etc.</td>
</tr>
<tr>
<td>2018</td>
<td>32/42 (7 – high study)</td>
<td>28/31 (1- higher study)</td>
<td>Highest: 40L; Lowest: 5.4L</td>
<td>Rakuten, GE, Flipkart, Samsung, Rakuten, Amazon, Qualcomm, Oracle, Samsung, Walmart, Amazon, Xilinx, Amazon, DE Shaw, etc.</td>
</tr>
</tbody>
</table>
CSE graduates doing higher studies @
Media coverage

• IITH develops dataset to understand online user engagement *(The Hindu)*
• IITH develops AI-enabled software to catch bike riders without Helmet *(Times of India)*
• Coverage in technical news websites: InsideHPC, HPCWire, etc.
Entrepreneurial Activities

Three start-ups

- Plianto Technologies ([http://www.plianto.com/](http://www.plianto.com/)) by Dr. Sobhan Babu
- StoryXpress by students
- Kaddi Labs by students
Common Computing Resources

- 32+ high-end servers (Intel Xeon E5 Series CPUs)
- 60+ 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
Samsung Digital Academy

- 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
For updates ...

https://www.facebook.com/cseiith

https://www.twitter.com/cse_iith

http://cse.iith.ac.in/
Upcoming CSE-EE Department Building
COME JOIN US!

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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Indian Institute of Technology Hyderabad