



# ACM India's Initiatives in CS Education and Research

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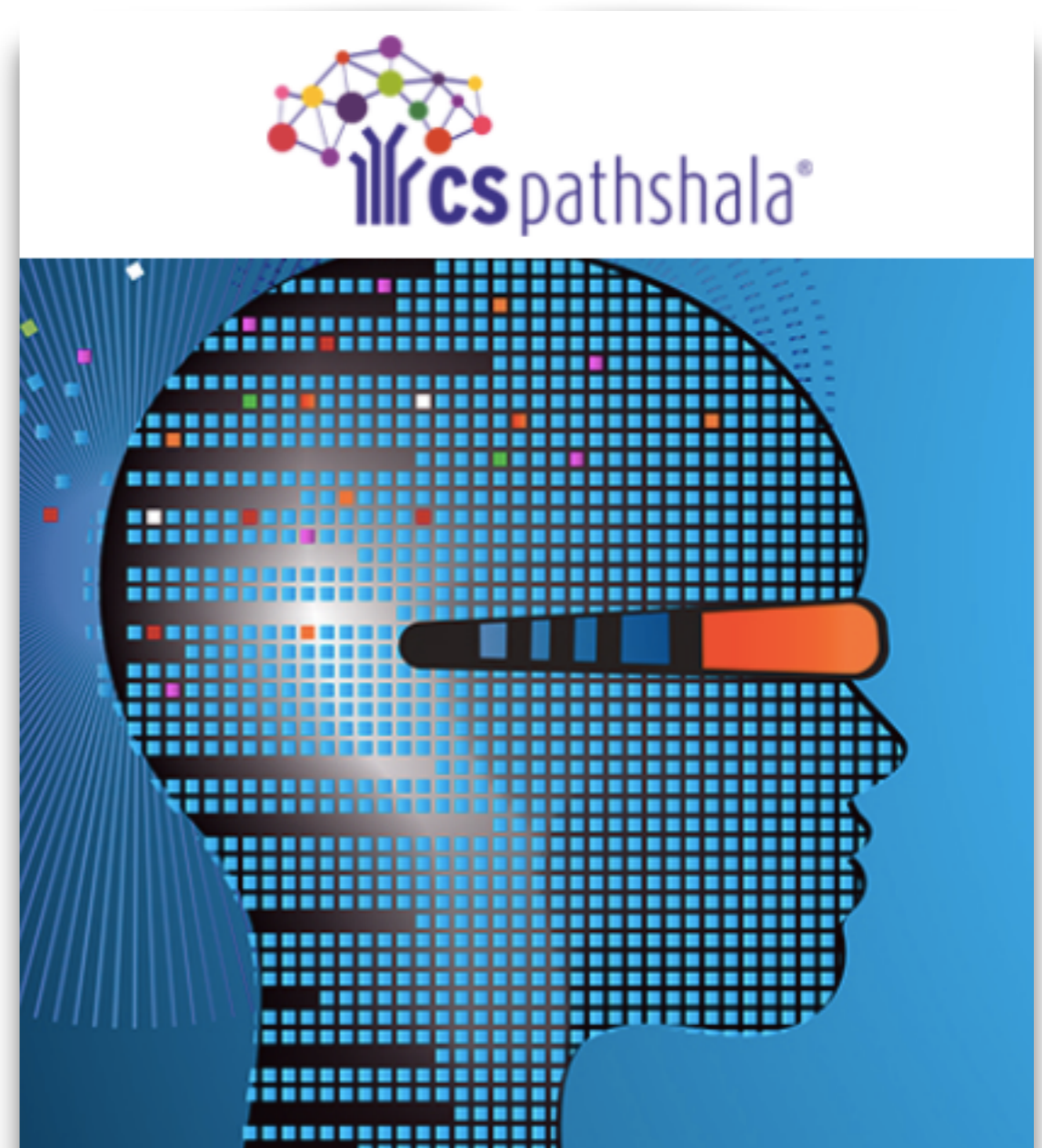
# ACM India

Since its inception 2010,  
major focus on enhancing  
CS education and  
research in India



AWARDS & RECOGNITION

ACM India 2018 Doctoral  
Dissertation Award [↗](#)

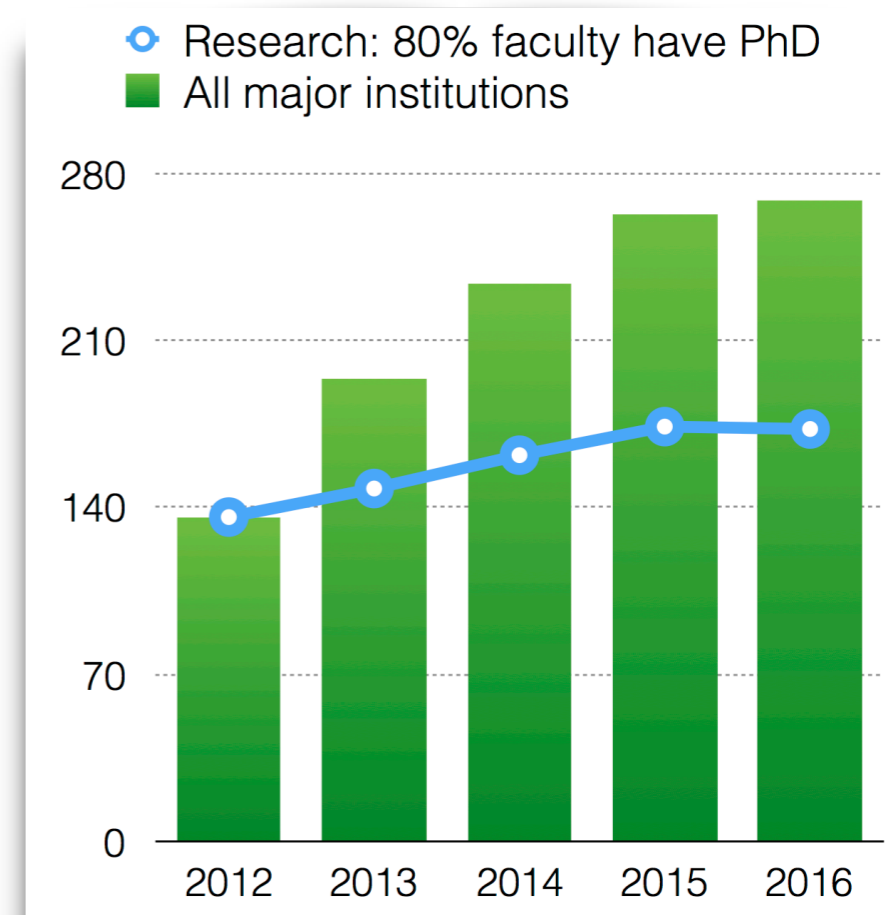


# Research



## Research Board

- Doctoral Dissertation Award
- PhD production survey
- Leading conferences to India
  - ICSE, POPL, VLDB ...
- ACM-IARCS grants to attend international conferences
- IRISS
- Academic Research Summit (with MSR)



# Education



## Education Committee and iSIGCSE

- Updating the undergraduate CS curriculum
- Faculty development resources
- ACM Summer Schools
- National Programming Aptitude Test
- CSpashala: Computational thinking in schools



# Research



- PhD production is going up
  - ... but curve is flattening
- Lack of awareness about how to approach research
  - “Address gap in literature”
- Mentorship programmes?
- Attract undergraduates to pursue research?
  - Summer schools, internships, mentoring



AWARDS & RECOGNITION

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# Curriculum

- Awareness workshops on CS2013 curriculum
- Too “abstract” for the Indian context?
- Develop detailed course outlines for core courses
  - Syllabus + Examples, Assessment, ...



## Computer Science Curricula 2013

Curriculum Guidelines for  
Undergraduate Degree Programs  
in Computer Science

December 20, 2013

The Joint Task Force on Computing Curricula  
Association for Computing Machinery (ACM)  
IEEE Computer Society

A Cooperative Project of



Association for  
Computing Machinery  
Advancing Computing as a Science & Profession



IEEE



# Curriculum

- Some progress talking to formal bodies
  - AICTE
  - Boards of Studies
- Still a challenge to adopt and deliver new curriculum
- Faculty (re)training?



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IEEE



# Faculty development

- Traditionally focus on subject matter expertise
- Need to also provide guidance on effective teaching
- Create resources
  - Abhiram Ranade's NPTEL MOOC on teaching introductory programming



NPTEL Online Certification

Course Name: Design and pedagogy of the introductory programming course

About Course Certificate Type

Toppers list Statistics

Forum

Prof Abhiram Ranade Introduction

A video player interface showing a video titled 'Prof Abhiram Ranade Introduction'. The video frame shows a man in a dark suit and light blue shirt speaking. The background of the video is a colorful, abstract graphic with blue and red tones, featuring a globe and some technical-looking elements. A play button is visible in the center of the video frame.



# Research in CS education

- iSIGCSE
- Technology for education is gaining traction
- Need to collect and analyse data in an Indian context
  - What works? What doesn't?
- Move from anecdotal to evidence based



The screenshot shows the website for the IEEE ComSoc Social Networks Technical Committee. The top navigation bar is blue with the IEEE ComSoc logo and the text 'IEEE Communications Society' and 'Social Networks Technical Committee'. Below the navigation bar are social media icons for Facebook, LinkedIn, and Twitter. A search bar with the text 'Google Custom Search' and a magnifying glass icon is visible. The main content area features the text 'The 8th IEEE International Conference on Technology for Education (T4E 2016)'.

# Measurement



## Research in CS education

- National Programming Aptitude Test
  - NPTEL, Google, ACM-I
  - Viraj Kumar, Satyadev Nandakumar, MM
- Measure basic competence
- How to conduct a reliable nationwide test?

## National Programming Aptitude Test (NPAT) 2017 on 13 Aug, registration open

| #TOP NEWS | CAREER CORNER | EVENT | 1 YEAR AGO



# CSpaathshala



- Computational thinking in schools
- Curriculum for Class 1–8
- Launched in 2016, 650+ schools, 3 lakh students, 1800+ teachers trained
- Over 200 detailed lessons available online
- Government schools — state government initiatives
- School boards, textbooks — CBSE, NCERT, TN SCERT



# CS in schools



- Goal is not to create programmers
- Awareness of computing is becoming critical
- How to integrate better with other subjects?
- How to measure impact in “critical thinking”?



# Summary



## Research and education

- Much has happened ...
- ... but much remains to be done
- The Indian context is very special
  - Understand it better
  - Find solutions that scale
  - “Work” the system

