ACM India's Initiatives in CS Education and Research

Madhavan Mukund
Chennai Mathematical Institute
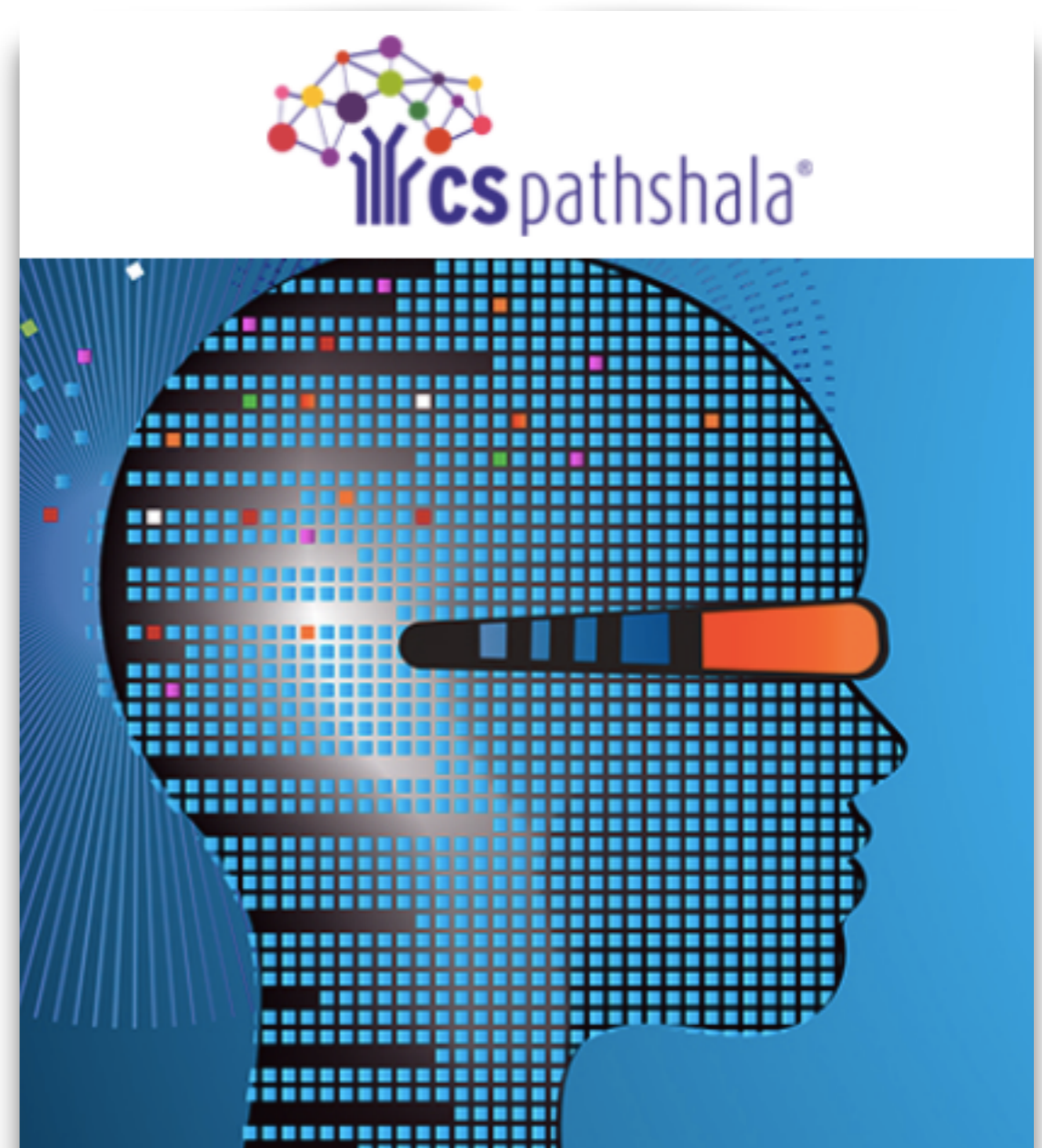http://www.cmi.ac.in/~madhavan

ACM India

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

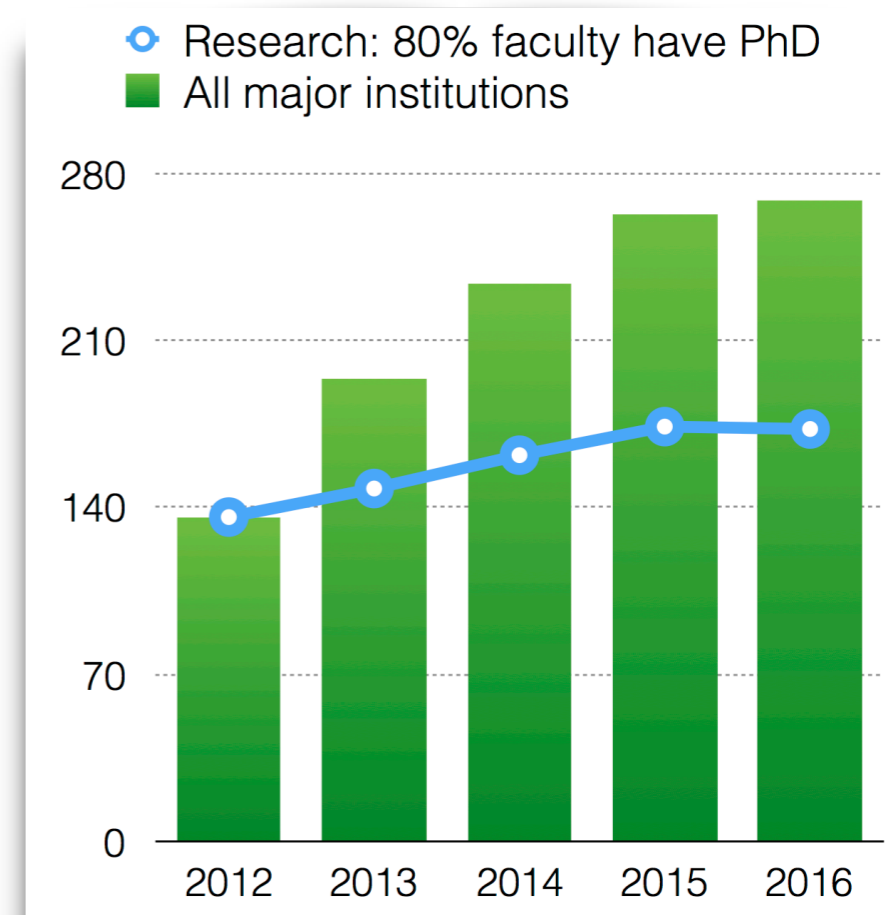AWARDS & RECOGNITION

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

- CSpathshala: 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

ACM India 2018 Doctoral Dissertation Award⧉

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

IEEE computer society

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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A Cooperative Project of

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

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

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

CSpathshala

- 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