The Institute of Mathematical Sciences, Chennai

Accomplishments during January to March 2017 at IMSc.

> ### Machine Learning (Prof. Ronojoy Adhikari)

A new machine learning algorithm, based on deep convolutional neural networks, was designed to recognize characters of the Indus script from digital images of Indus artefacts. The algorithm has potential uses in image recognition, including disease diagnosis such as diabetic retinopathy. The work was covered in The Hindu, The Telegraph, the Wire, and on SBS Radio, Australia. The manuscript is available on the arxiv server at https://arxiv.org/abs/1702.00523.

> ### Genome Sequencing (Prof.Rahul Siddharthan)

A new method of analysing high-throughput "ChIP-seq" data, i.e. data from experiments that report genome-wide binding sites of transcription factor, has been developed. The bioRxiv manuscript (A Agrawal, L Narlikar, R Siddharthan) has attracted considerable interest and over 200 PDF downloads http://biorxiv.org/content/early/2017/01/29/104109.

> ### Approximation Algorithms (Prof. Saket Saurabh)

A new framework to study efficient preprocessing for optimization problems called "Lossy Kernelization" has been introduced. This paper is now accepted in the prestigious Symposium on Theory of Computing, 2017. Applications show the intractability of certain optimization problems whose complexity status has been open for over a decade.