

Preface

IKDD is the professional chapter of SIGKDD in India and a part of ACM India. As a professional chapter, IKDD brings together researchers, students and industry professionals interested in theory and applications of various disciplines of artificial intelligence such as machine learning, deep learning, data mining, search and analytics. We strive to improve the quality and quantity of this capability within India by organizing seminars, conferences, workshops, lecture series in above mentioned and related areas so the professionals, students, teachers, and researchers can benefit.

The flagship activity of IKDD is the Conference on Data Science (CoDS) running since 2013. The last edition happened 11-13th January in the International Center Goa. The conference drew about 375 registered attendees which surpassed the registration count for all past years. About 175 papers were submitted across different tracks from industry and academic institutions. This edition would also remain as a landmark as it merged the series of CoDS and long running COMAD (Conference of Management of Databases) conferences and thereby bringing the vibrant Data Science and Databases communities in the country together under a common theme. One of the highlights of the conference was three high-profile keynote speakers - Anima Anandkumar (Principal scientist at Amazon Web Services & Endowed Professor at Caltech), Manik Varma (Principal Researcher, Microsoft Research India & Adjunct Professor of Computer Science, IIT Delhi) and Surajit Chaudhuri (Distinguished Scientist, Microsoft Research, Redmond). All the keynote talks were well attended and engaging with long post-talk Q&A sessions. This edition of the conference also had eight invited academicians from India and foreign academia covering their latest research in their respective research areas. Industry track brought strong speakers and participants from MNCs and Indian companies through talks, tutorials and panel discussions. The Proceedings for the conference is available at [ACM DL](#)¹

and details of the sessions are available on the conference [website](#)².

Another annual activity undertaken by IKDD is a “Data Science in India” event collocated with the ACM SIG KDD Conference since 2015. This is the flagship conference of the SIG and has participation from all the top international groups. The goal of this event is to showcase the growth of KDD/Data Science in India. In 2018 the event was collocated with KDD 2018 in London ([website](#))³. At the event, eight prominent researchers spoke about their latest research either from India or in collaboration with an Indian institution. The event attracted KDD researchers from various parts of the world and from academia/industrial labs/startups and companies and offered a great networking opportunity."

Going forward, we would like to increase the activities under the IKDD umbrella. We are launching a quarterly newsletter from IKDD to cover research and development activities happening in companies and academia in India. The newsletters will include blogposts by eminent as well as early stage researchers; listing of recent papers from India in relevant conferences; other relevant news items etc. We intend to introduce additional onsite events especially targeted at new entrants to the field during the year. If you are interested in becoming a member of IKDD please contact at the conference registration desk or send an email to IKDDOffice@gmail.com. Finally, a community needs active volunteers to make it a vibrant one – if you are willing to become a volunteer please contact either of the undersigned.



B. Ravindran
(Chair)



Shourya Roy
(Vice Chair)

1. <https://dl.acm.org/citation.cfm?id=3152494>

2. <http://cods-comad.in/2018/index.html>

3. <https://ikdd.acm.org/kdd2018/>

History and Mission of IKDD

Gautam Shroff, TCS Innovation Labs and B. Ravindran, IIT Madras

IKDD began with a conversation between Dr. Gautam Shroff and Dr. Vasudeva Varma (Vasu), at the 2011 ISEC (India Software Engineering Conference). ISEC, the brainchild of Pankaj Jalote, had recently become the India chapter of ACM SIGSOFT under ACM India. "Should we not be doing something similar for 'analytics'", debated Vasu and Gautam. Over the next year, Dr. B. Ravindran joined them, and they socialized this idea with the 'data science' research community in India, spanning information retrieval as well as machine-learning folks. In fact, the first suggestion for the SIG was "ICSA" for 'search and analytics'. It was soon found that in order to become a chapter of an ACM SIG, one had to inherit its name, so IKDD was founded as the India chapter of ACM SIGKDD, under ACM India, with the wholehearted support of Mathai Joseph, Anand Deshpande and Srinivas Padmanabhuni, the successive ACM India presidents to date then.

IKDD's first event was a Mysore Park workshop in early 2013, support of Infosys secured with the assistance of Dr. Lokendra Shastri. The workshop was successful in bringing the community together, with invited talks from many India-based as well as overseas researchers, and the participation of many students as well. Towards the end of this workshop IKDD collectively decided to launch the CoDS series of conferences, and the first CoDS was held in 2014 in Delhi. There were seven excellent invited speakers, which set the stage for the conference series, both in terms of ensuring participation in the next event as well as securing multi-year support commitments from selected industry sponsors.

CoDS has grown from strength-to-strength through successive editions in Bangalore, Pune, Chennai and Goa. The really satisfying aspect of CoDS is that it

succeeded in attracting active participation from both academia and the industry. Given the significant overlap of interests and attendees between the long running Conference on Management of Data (COMAD) and CoDS the organizers of the two events decided to co-locate the events in Pune. Given the success of the experiment it was decided to continue that in Chennai, and eventually culminating in the merging of the two conferences last year in Goa. This led to a significant spike in attendance as well as submissions.

With the launch of IKDD another opportunity presented itself to showcase the KDD activity in India. IKDD was invited to organize a perspective on Data Science in India as a collocated event with ACK SIGKDD 2015 in Sydney, Australia. The event was a big success and it was decided to continue to run that in successive editions. IKDD was the first national chapter of SIGKDD to do this and were duly followed by China.

CoDS-COMAD is today a looked for event by the data science community in India and IKDD is poised to engage with the community in a more sustained and meaningful way in the coming years. We look forward to building a vibrant and successful data science ecosystem in India.



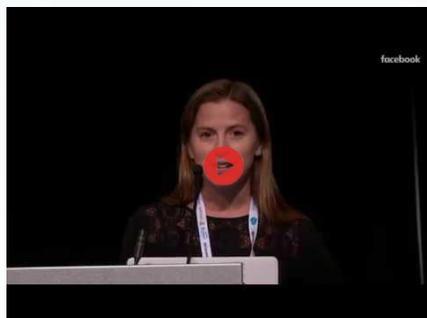
Gautam Shroff



B. Ravindran

Selected Invited Talks from NeurIPS 2018

In this section, we highlight three invited talks from recently concluded NeurIPS 2018 Conference. NeurIPS is arguably the most prestigious venue for scientific publications in Machine Learning with increasing popularity and attendance. This year the conference was attended by more than 8,000 people! Experience a supercharged video viewing experience with Table of Content (ToC) and Phrase Cloud, powered by VideoKen (<https://www.videoken.com/>).



What Bodies Think About: Bioelectric Computation Outside the Nervous System, Primitive Cognition and Synthetic Morphology, Michael Levin; Allen Discovery Center at Tufts University

<https://videoken.com/embed/RjD1aLm4Thg>

Brains are not unique in their computational abilities. Bacteria, plants, and unicellular organisms exhibit learning and plasticity; nervous systems speed-optimized information-processing that is ubiquitous across the tree of life and was already occurring at multiple scales before neurons evolved. Non-neural computation is especially critical for enabling individual cells to coordinate their activity toward the creation and repair of complex large-scale anatomies. We have found that bioelectric signaling enables all types of cells to form networks that store pattern memories that guide large-scale growth and form. In this talk, I will introduce the basics of developmental bioelectricity, and show how novel conceptual and methodological advances have enabled rewriting pattern memories that guide morphogenesis without genomic editing. In effect, these strategies allow reprogramming the bioelectric software that implements multicellular patterning goal states. I will show examples of applications in regenerative medicine and cognitive neuroplasticity, and illustrate future impacts on synthetic bioengineering, robotics, and machine learning.



Designing Computer Systems for Software 2.0, Kunle Olukotun; Stanford University

https://videoken.com/embed/M_dSlcwNijc

The use of machine learning to generate models from data is replacing traditional software development for many applications. This fundamental shift in how we develop software, known as Software 2.0, has provided dramatic improvements in the quality and ease of deployment for these applications. The continued success and expansion of the Software 2.0 approach must be powered by the availability of powerful, efficient and flexible computer systems that are tailored for machine learning applications. This talk will describe a design approach that optimizes computer systems to match the requirements of machine learning applications. The full-stack design approach integrates machine learning algorithms that are optimized for the characteristics of applications and the strengths of modern hardware, domain-specific languages and advanced compilation technology designed for programmability and performance, and hardware architectures that achieve both high flexibility and high energy efficiency.



Reproducible, Reusable, and Robust Reinforcement Learning, Joelle Pineau; McGill University

<https://videoken.com/embed/Kee4ch3miVA&t>

We have seen significant achievements with deep reinforcement learning in recent years. Yet reproducing results for state-of-the-art deep RL methods is seldom straightforward. High variance of some methods can make learning particularly difficult when environments or rewards are strongly stochastic. Furthermore, results can be brittle to even minor perturbations in the domain or experimental procedure. In this talk, I will review challenges that arise in experimental techniques and reporting procedures in deep RL. I will also describe several recent results and guidelines designed to make future results more reproducible, reusable and robust.



Why do we need Depth in Deep Networks: A Statistical Mechanics perspective on DBMs

Chiranjib Bhattacharyya

Department of Computer Science and Automation
Indian Institute of Science

The success of Deep Learning poses a fundamental question on when and why one should use multi-layering. This important issue has profound practical implications and is an extremely active area of research. However, most of these investigations have been limited to Supervised Learning architectures, such as CNNs. In this post we draw attention to unsupervised Learning architectures, more specifically Deep Boltzman Machines (DBM), which require a very different approach from Supervised Learning frameworks. Understanding the representation power of DBMs, we empirically observe that the existing limits are highly pessimistic. Towards building more accurate estimates, we propose a new measure of Inherent Structure Complexity (ISC) building on the theory of Spin-Glasses from Statistical Mechanics. ISC can be used effectively as a measure of representational power of a DBM as well as leveraged to obtain suggestions on when to use Multi-layer DBMs

You can read the full version of this interesting blog at <https://ikdd.acm.org/newsletters>



Diaries of a Young Indian Research Scholar

Ankit Anand

DeepMind

In this blog, Ankit Anand a bright young researcher shares his experiences in being a data science researcher in India. He recently joined Deep Mind after a successful stint as a PhD researcher at IIT Delhi. In the free flowing blog he shares his motivation for data science and the journey he took navigating through the field of data science. Further he provides useful tips for young researchers in India looking to be part of this exciting and fast growing field.

You can read the full version of this interesting blog at <https://ikdd.acm.org/newsletters>