APPCAIR News

Volume 1, Issue 1 **June 2020**

APPCAIR Starts Up

The Anuradha and Prashanth Palakurthy Centre for Artificial Intelligence Research, or APPCAIR, was officially inaugurated on 17 February 2020 at 8:45 AM by Anuradha and Prashanth Palakurthi. The inauguration happened in the presence of the VC, Directors, Deans, and several faculty members. Anuradha and Prashanth, Alumni of BITS Pilani, have made a generous commitment to contribute 1 million USD to the Centre.

As an idea, AI has been with us for over 2000 years. When Apollonius described Talos in *The Argonautica*, he was calling on an older idea. Indeed, two hundred years earlier, in the *Leizi*, a humanoid robot astonished a king, and—in perhaps the earliest description of an unintended consequence of AI—infuriated him by winking at his favourite mistress. And AI has been on the agenda for us ever since computers were built in the 1940s. After alternating decades of boom and bust, we stand once more at a point of cautious optimism. Thanks to a combination of advances in hardware, huge investments by industry, and of course, sustained academic research, we now think that AI can contribute usefully to one of the two roles anticipated by Alan Turing, as a tool for engineering intelligent artifacts. At APPCAIR, we want to be part of this future. Here are some areas of focus

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Inside This Issue

Infrastructure news

We have an (almost) functional special-purpose AI Lab, which has a capacity of seating for 8-10 researchers. A small meeting area adjacent to the AI Lab has been identified. Dedicated office-space for the Head of APPCAIR and for a long-term visitor has been made available in the CSIS Department of BITS Goa. High-end desktop machines have been ordered as a part of the Industrial Projects involving APPCAIR.

Research news

During the first quarter of 2020 5 r conference papers and 2 journal papers have been accepted, In addition, 3 journal papers are under review.. APPCAIR researchers are involved in 1 grant submission in Theoretical Machine Learning and 2 Interdisciplinary grants jointly with life science in Computational Neuroscience and Computational Drug-Design.

Industry news

APPCAIR now has agreements to be part of student-based projects with :

TATA CONSULTANCY SERVICES

REFLEXIS

People news

APPCAIR now has a Scientific Advisory Board.

People Update (contd.)

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APPCAIR STARTS UP (CONTD.)

APPCAIR Focus Areas

CONCEPTUAL AI

- Mathematical Foundations of AI
- Scientific Understanding of Brains and Behaviour.

APPLICATIONS OF AI

- Applications to benefit of society
- Developing a skilled workforce for the industry.

IMPLEMENTATIONS OF AI

- Training programs on state-of-the-art tools and techniques.
- General frameworks for Intelligent Modelling (I.M), Intelligent Assistants (I.A) and Intelligent Infrastructure (I.I).

RESPONSIBLE AI

- Ethics and AI
- Explainable AI

The pandemic poses many challenges to us, as we start up. But, we are determined to make a success of APPCAIR, and look forward to the future with energy. As was once said of a different Grand Challenge: we choose to do this, not because it is easy, but because it is hard.

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Ashwin Srinivasan

Head, APPCAIR

Scientific Advisory Board

Gautam Shroff
TCS

Amit Sheth
USC

Anand Rao
PWC

B Ravindran
IIT Madras

APPCAIR welcomes:

Snehanshu Saha, who works on:

Theory of Deep learning
Parsimonious Learning
Metaheuristic Multiobjective Optimization
Chaotic Neural Nets
Application to Large Astronomy Data set

Yellumaharaj
Administrative Support

Shreenivas Naik
IT Support

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Some Student Projects

Adiya Ahuja, worked on joint training of neural – symbolic models

Adithya Niranjan, worked on transfer learning of language models

Het Shah, worked on compressing deep network models for scalability

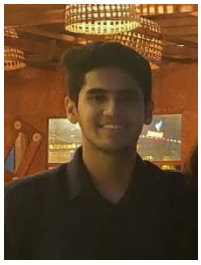
Rishab Khincha and Soundarya Krishnan worked on Deep Learning for identifying Covid-19 patients from chest X-rays. Adithya also helped with symptom models

Soundarya and Rishab also worked on transfer of deep network modes for detection of lesions in organs

Student Projects (contd.)

Ashutosh Jha, worked on developing a systtem for semi-automated acquisition of rules with exceptions for anomaly detection

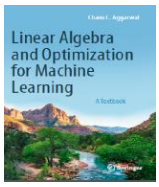
Naigam Shah, worked on analysing time-series data using Deep Learning



Ashwin Vaswani, looked at hyperparameter tuning for machine learning algorithms

Arshia Arya and Sharad Chitlangia, worked on causal attribution in neural-symbolic models

Book Review



Most Linear Algebra books expect readers to develop insights from the abstract presentation of material, for application in various applied fields, including Machine Learning and Optimization. This is perhaps by design. The book *Linear Algebra and Optimization for Machine Learning*, authored by **Charu.C. Aggarwal** is an exception. This book is possibly the first "systematic" approach to integrate the ideas in linear algebra and optimization while studying the solutions to machine learning applications. A book that caters to Machine Learning as a set of "Case studies" of Linear Algebra and Optimization is a welcome and a much needed departure from the classical way of understanding Machine Learning. A must-read for practitioners in Machine Learning. (Review by Snehnshu Saha)

AI World

- *See how John Burn-Murdoch's DataViz has changed the way we make sense of the pandemic: here*
- *Data from the Hubble Telescope has changed the way we see the universe: see here*
- *Have you seen: Mathematics for Machine Learning by Marc Peters and others?*
- *Is this useful: How to do hyperparameter tuning on any Python script*

In Memory Still Green: **Nils Nilsson (1933—2019)**

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