

WEBINAR SERIES

29 October 2021

1300 – 1400h (UTC +8)

Zoom Meeting Link:

<https://berkeley.zoom.us/j/92771443204?pwd=cDhYbWoyenM4aUhKYThS00pzZlE2QT09>

Meeting ID: 927 7144 3204

Passcode: 196792

The webinar will be recorded.

NATIONAL RESEARCH FOUNDATION



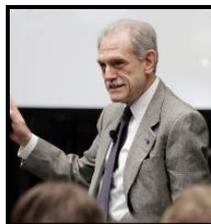
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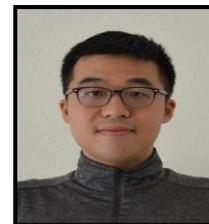
Programme

- 1300 h Welcome and Introduction
- 1305 h Machine Learning for Preventing and Combating Future Pandemics
by *Hari Prasanna Das & Dr Baihong Jin*
- 1350 h Question and Answer
- Prof Alberto Sangiovanni-Vincentelli, Professor
 - Dr Baihong Jin, Postdoctoral Scholar
 - Hari Prasanna Das, PhD Candidate
 - Xiangyu Yue, PhD Candidate



**Prof Alberto
Sangiovanni-
Vincentelli**

University of
California, Berkeley
(SinBerBEST)



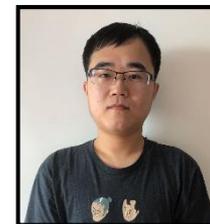
Dr Baihong Jin

University of
California, Berkeley
(SinBerBEST)



**Hari
Prasanna Das**

University of
California, Berkeley
(SinBerBEST)



Xiangyu Yue

University of
California, Berkeley
(SinBerBEST)

For more information, please email bjin@eecs.berkeley.edu

About the Lecture

Healthcare AI has shown great potential in diagnosing and combating diseases such as diabetic retinopathy. Currently, to train a high performing deep learning model, a large number of high quality, accurately labeled data, as well as substantial computing resources, are needed. These data are unlikely to be found especially during early phases of a disease outbreak. Moreover, deep learning models can give overly confident predictions on out-of-distribution data, which may be misleading to the diagnosticians. We will describe two techniques to enable rapid identification of novel diseases like COVID-19 under limited data. The first technique addresses the challenge of label scarcity, and makes use of a conditional generative flow and a classifier for conditional synthetic data generation. The second technique helps detecting out-of-distribution inputs to a deep learning-based classification model. The model uses modern anomaly/outlier detection algorithms to analyze the outputs of a supervised classification model in order to identify potentially novel diseases. We present case studies using real-world medical image data and show the efficacy of proposed techniques.

About the Team

Prof. Alberto Sangiovanni Vincentelli holds the Edgar L. and Harold H. Buttner Chair at the Department of EECS, University of California, Berkeley (UCB). He is member of the Advisory Board of the Lester Center for Innovation of the Haas School of Business and of the Berkeley Roundtable of the International Economy (BRIE), and is Honorary Professor at Politecnico di Torino. He is an IEEE and an ACM Fellow, and a member of the National Academy of Engineering. Recipient of the Kaufman Award of the Electronic Design Automation Council for “pioneering contributions to EDA” and of the IEEE/RSE Maxwell Medal “for groundbreaking contributions that have had an exceptional impact on the development of electronics and electrical engineering or related fields”. He authored over 1,000 papers and 17 books. He has co-founded enterprises in US and Europe including Cadence and Synopsys, the two largest Electronic Design Automation companies. He has advised Intel, IBM, HP, General Motors, ATT, GE, Kawasaki Steel, Fujitsu, Hitachi, Mercedes Benz, BMW, Magneti Marelli, Pirelli, Telecom Italia, and sits on the Board of Directors of Cadence, KPIT Technologies, Expert System, Cy4Gate and Exein. He is the Chairman of the Board of Quantum Motion, Phoelex, Innatera and Phononic Vibes.

Baihong Jin is currently a postdoctoral scholar at the EECS Department of UCB, and is also part of the SinBerBEST Program. Dr. Jin’s research interests include machine learning, anomaly detection and fault management.

Hari Prasanna is a Ph.D. candidate at the EECS Department of UCB, and a Graduate Student Researcher for the SinBerBEST program. Hari’s research interests lie at the intersection of Deep Semi-supervised Learning, Smart and Energy-efficient Buildings, and Climate Change Mitigation.

Xiangyu Yue is a Ph.D. candidate at the EECS Department of UCB. His research interest lies in machine learning, transfer learning, soft computing, and computer vision.