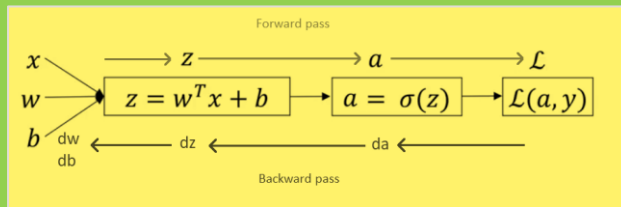# VIT®
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Two Day Faculty Development program on
Deep Learning with TensorFlow

Date: July 18 and 19, 2019

Co-ordinators

Dr. Mathew Mithra Noel

Dr. Geetha Mani

Dr. M. Monica Subhashini

**Organized by
Department of Control & Automation
School of Electrical Engineering
Vellore Institute of Technology,
Vellore-632014.**

ABOUT THE WORKSHOP

This workshop will provide an understanding of Machine Learning concepts and skills required to develop and use deep neural network models using the Open Source TensorFlow platform. Participants will gain a deeper understanding of the Python programming language and Numpy library. The workshop will also provide a concise introduction to the mathematics required for a broader understanding of Machine Learning vis-à-vis Linear Algebra, Probability Theory and Multivariable Calculus.

Topics covered:

1. Machine Learning – A new data-driven programming paradigm
2. Supervised, Unsupervised and Reinforcement Learning
3. Multiclass classification and Regression
4. Dense Feedforward Neural Networks
5. Implementing dense layers in TensorFlow
6. Convolution Neural Networks
7. Implementing Convolution networks using TensorFlow
8. N-Dimensional array manipulation using Numpy, Broadcasting arrays
9. Implementing Linear Regression and Logistic Regression using Numpy
10. The Backpropagation algorithm
11. Vectorizing Backpropagation over mini batches
12. Regularization to avoid over-fitting
13. Hyper-parameter tuning and cross-validation
14. Transfer learning and auto-encoders
15. Application to Biomedical signal processing

ABOUT THE INSTITUTE

VIT was founded in 1984 as Vellore Engineering College by the Chancellor Dr. G. Viswanathan. From its humble beginning, the institution has grown exponentially to that of having more than 33,000 students. Students from all the states of India and from more than 50 countries are studying at VIT. University status was conferred in 2001 by MHRD Govt. of India in recognition of its excellence in academics, research and extracurricular initiatives. Currently, VIT has 4 campuses – in Vellore, Chennai, Amaravati (AP) and Bhopal (MP). The National Institutional Ranking Framework (NIRF) of the MHRD, Government of India, has identified VIT as the best Private Engineering Institution in India in the year 2016 and in 2017.VIT has gone for accreditation by NAAC [India], IET [UK], and ABET [USA] and follows world class academic processes. VIT is the first and only University in India to get 4 star rating from QS, the world universities ranking organization. The Industry consortium FICCI, has declared VIT as the "University of the Year 2016", in India. **VIT – Ranked No.1 private institution for Innovation (ARIIA 2019 Award) by Govt.of India**.

RESOURCE PERSON

Dr. Mathew Mithra Noel received his Ph.D. in Electrical and Computer Engineering from the University of Alabama-Birmingham, USA in 2005. Later he served as an Assistant Professor in Electronics Engineering at Norfolk State University, USA from 2006 to 2009. He received his M.E. in Electronics and Control from BITS (Birla Institute of

Technology and Science) Pilani. He is currently a full Professor in the School of Electrical Engineering at VIT. His research interests are Machine Learning, Control and nature inspired Global Optimization Algorithms. His current research focuses applies Reinforcement Learning to problems with high dimensional state/action spaces and partially supervised RL. He works with the industry to apply machine learning to practical problems. He was the recipient of the Graduate School Scholarship at the University of Alabama-Birmingham, USA, Teaching Assistantship at BITS, Pilani STARS Summer Research Grant 2006 & 2009 and Best Teacher Award at Norfolk State University, USA.

Dr. N. Sivakumaran is currently a professor of Instrumentation & Control Engineering Dept., National Institute of Technology, Tiruchirappalli, India. He obtained PhD from NIT, Tiruchirappalli under National Doctoral Fellowship, AICTE in the year 2004 where he worked on Identification and Control of Nonlinear Processes using Recurrent Neural Networks. He is interested in working on Real Time Implementation of problems that arise out of optimization methods in Process Control and Biomedical Instrumentation applications. He has several significant papers in international conferences and journals. He was a recipient of Government of India's Young Scientist award under DST in 2007 for his funded project "Online Control of Multivariable system using Soft Computing" and Young Faculty Research Scheme in 2018. He was instrumental in submission and coordination of TEQIP-II.

Dr. Karthick is an Assistant Professor in the Department of Instrumentation Engineering at NIT Trichy, India. He has done B.E. in Electronics and Instrumentation Engineering from Anna University, M.Tech and Ph.D. in Bio-Medical Engineering at the Department of Applied Mechanics from Indian Institute of Technology Madras. Prior to joining the independent position, he was a postdoctoral research scholar at the EEG, Imaging and Epilepsy Lab, Montreal Neurological Institute and Hospital,

McGill University, Canada and Dauwels Lab, Nanyang Technological University, Singapore. His research interests are primarily in the field of biomedical signal processing and machine learning algorithms that includes deep brain stimulation, brain machine interface and cognitive neuroscience. He has received several innovative research awards (4), travel grants (2) and certificates on excellent publications and research.

REGISTRATION

Students/Research Scholars : Rs. 1000/-
Faculty   : Rs. 1500/-

*Registration fee includes GST of 18%, course materials, working lunch, high tea and snacks. Accommodation will be provided in VIT hostels on payment basis. The number of seats is limited. So preference will be given based on first come first serve basis.

IMPORTANT DATES

Last date for online registration: 13-07-2019

HOW TO APPLY

Registration for the workshop can be made by paying the fee online using the following link
http://info.vit.ac.in/Events-VIT/Deep_Learning-TensorFlow/apply.asp
Mail the generated registration receipt to the following email address.

Dr. Geetha Mani
Associate Professor, School of Electrical Engineering, Vellore Institute of Technology, Vellore-632014.
Email: **geetha.mani@vit.ac.in**
Contact No: 9566919631/9789995372

Kindly select debit/credit card option to avoid the addition of TAX amount with actual fee.

Registration Form

Two Day Faculty Development Program on Deep Learning with TensorFlow

July 18 and 19, 2019

Name : ……………………………………

Designation :…………………………………

Affiliation :……………………………………

Address :……………………………………

……………………………………………

……………………………………………

Email :……………………………………

Gender: Male/ Female

Mobile : ……………………………………

Accommodation Required: Yes / No

(Only for female participants on payment basis)

Place: …………………

Date : …………………

Signature of the applicant