Curriculum Vitae – Goutham Gopalakrishna

Personal Information

Goutham Gopalakrishna

EPFL CDM SFI EXTRA 128 (Extranef UNIL),
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Door no 14, Plot no 15, LH Nagar 1st Street
Adambakkam, Chennai-600088, India.

Education

PhD in Finance
Ecole Polytechnique Federale de Lausanne (Swiss Finance Institute), Switzerland *Sep 2017-Current*
Coursework : Stochastic Calculus, Asset Pricing, Dynamic Asset Pricing, Theoretical Corporate Finance, Financial Intermediation, Empirical Corporate Finance, Empirical Asset Pricing, Game Theory, Econometrics.

Master of Science in Economics
University of Bologna, Italy *Sep 2015-July 2017*
Grade : 30 cum laude
Coursework : Econometrics, Big Data, Macroeconomics, Microeconomics, Finance, International Trade, Econometrics of Asset Pricing.

Bachelor of Engineering, Computer Science
Govt. College of Engineering, Anna University, India *Aug 2005-May 2009*
Grade : First Class
Coursework : Object Oriented Programming, Engineering Mathematics, Discrete Mathematics, Parallel Computing, Design and Analysis of Algorithms, Numerical Methods, UNIX, Control Systems, Computer Architecture, Operating Systems.

Research Areas **Asset Pricing, Financial Intermediation, Machine Learning, Banking.**

Research Papers **Asset Pricing with Realistic Crises Dynamics** (*SSRN*)

ALIENs for Continuous Time Economics (*Work in progress*)

Awards **University of Bologna Merit Scholarship** worth EUR 22,000 for outstanding academic record
Swiss Finance Institute PhD Fellowship worth CHF30,000

Certification **CFA Level 3 Passed** *June 2014*
Eligible for charter upon completion of work experience.

Teaching Experience

Teaching Assistant, EPFL
- Financial Big Data, MFE (Graduate), Prof. Damien Challet *Fall 2018-current*
- Financial applications of Blockchain, MFE (Graduate), Dr. Jiahua Xu *Fall 2019-current*
- Academic Supervisor for Executive MBA *Spring 2020*

Business Experience

Moody's Analytics Knowledge Services (formerly Copal Amba)
Associate Vice President *July 2013-Aug 2015*
Quantitative Research Analyst *May 2012-June2013*

Computer Skills

Coding : Python, R, MATLAB, S-PLUS, Stata, SAS, Gretl, Visual Basic, C, C++, Advanced MS Excel, MS Access, MS SQL

Data : Time Series Analysis, Panel Methods, Machine Learning (PyTorch, TensorFlow, Keras, Horovod)

References

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ALIENs for Continuous Time Economics

Goutham Gopalakrishna

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Abstract

I develop a new computational framework called Active-Learned and Informed Equilibrium Nets (ALIENs) to solve continuous time economic models with endogenous state variables and highly non-linear policy functions. I employ neural networks that are trained to solve supervised learning problems that respect the laws governed by the economic system in the form of general parabolic partial differential equations. The economic information is encoded as regularizers that disciplines the deep neural network in the learning process. The sub-domain of the high dimensional state space that carries the most economic information is learned actively in an iterative loop, enforcing the random training points to be sampled from areas that matter the most to ensure convergence. I utilize a state-of-the art distributed framework to train the network that speeds up computation time significantly. The method is applied to successfully solve a model of macro-finance that is notoriously difficult to handle using traditional finite difference schemes. With the proliferation of deep learning and an increasing need to solve models that characterize global dynamics, I believe that this paper is a timely contribution that can enrich the financial economics literature. Lots of problems in continuous time are formulated in a small dimensional state space due to computational bottlenecks. The simplicity in implementing ALIENs offers tremendous opportunities in a wide range of fields such as macroeconomics, asset pricing, and dynamic corporate finance. Moreover, the fact that ALIENs are powered with data parallelism through minimal effort opens up new avenues to perform extensive quantitative analysis that requires experimentation and repeatedly solving models several times.