

Rishabh Singh

Email: rish283@ufl.edu • Web: <https://www.rishabsingh.com> • [linkedin.com/in/rishabh270](https://www.linkedin.com/in/rishabh270) • G-Scholar

PhD candidate (advisor: Prof. Jose C. Principe) at Computational NeuroEngineering Lab (University of Florida) seeking positions in research areas such as uncertainty in AI, trusted/interpretable AI, physics inspired AI and time-series analysis.

EDUCATION

UNIVERSITY OF FLORIDA

Doctor of Philosophy in Electrical and Computer Engineering (GPA: 3.71/4)

Master of Science in Electrical and Computer Engineering (GPA: 3.71/4)

Research Areas: Kernel Methods, Information Theory, Uncertainty Quantification, Machine Learning.

Coursework: Deep Learning, Big Data Ecosystems, Machine Learning in Time Series, Pattern Recognition, Noise in Linear Systems, Image Processing and Computer Vision, Quantum Information Science.

Gainesville, USA

Expected 2022

Aug 2016 - May 2018

VELLORE INSTITUTE OF TECHNOLOGY

Bachelor of Science in Electrical and Electronics Engineering (GPA: 8.46/10)

Vellore, India

Aug 2010 - May 2014

RESEARCH EXPERIENCE

UNIVERSITY OF FLORIDA - COMPUTATIONAL NEUROENGINEERING LAB (CNEL)

Research Assistant & PhD Candidate

Gainesville, USA

Aug 2017 - Present

- Developing physics inspired functional methods in the RKHS for obtaining representations of **data** and **neural network models** useful for following application domains:

- (i) Predictive uncertainty quantification of **deep learning models** under **data distributional shifts**.

- (ii) **Transfer learning** applications and quantification of **data transferability**.

- (iii) Optimal transport based **time-series dependency** quantification and **domain adaptation** techniques (in progress).

- Implemented Hierarchical Linear Dynamical Systems (HLDS) for video game **action sequence segmentation** (DARPA project) and for **dynamic texture synthesis**.

- Implemented a deep CNN using **tensorflow** to construct photo-realistic versions of human face sketches (CELEB-A database).

VELLORE INSTITUTE OF TECHNOLOGY

Undergraduate Researcher

Vellore, India

Jan 2013 - May 2014

- Performed a comparative analysis of induction motor **dynamic braking** schemes using **MATLAB** and **Simulink**.

- Collaborated with a **team of 40** members to build an electric car for **Formula Student (FS)** competition, UK (July, 2013).

INDUSTRY EXPERIENCE

RESEARCH SCIENTIST INTERN

Aventusoft LLC

Boca Raton, USA

May 2020 - Aug 2020

- Implemented **deep learning algorithms** for detecting fiducial points in **Electrocardiography** time series data as part of a downstream task of arrhythmia detection. The work was incorporated into company's product.

ASSISTANT MANAGER

Tata Motors Limited

Pune, India

Aug 2014 - May 2016

- Oversaw and improved vehicle **assembly line automation systems** with respect to safety, maintenance and productivity.

RELEVANT PUBLICATIONS

- Singh, R. & Principe, J.C. (2021). **Quantifying Model Predictive Uncertainty with Perturbation Theory**. under review. [[paper link](#)]

- Singh, R. & Principe, J.C. (2020). **Toward a Kernel-based Uncertainty Decomposition Framework for Data and Models**. Neural Computation 2021; 33 (5): 1164–1198. [[paper link](#)]

- Singh, R. & Principe, J.C. (2020). **Time Series Analysis using a Kernel based Uncertainty Decomposition Framework**. Conference on Uncertainty in Artificial Intelligence (UAI) 2020. [[paper link](#)]

- Singh, R., Yu, S., & Principe, J.C. (2020). **Composite Dynamic Texture Synthesis using Hierarchical Linear Dynamical System**. 2020 IEEE International Conference on Acoustics, Speech and Signal Processing. [[paper link](#)]

- Singh, R. & Principe, J.C. (2018). **Correntropy Based Hierarchical Linear Dynamical System for Speech Recognition**. In proceedings of 2018 International Joint Conference on Neural Networks (IJCNN). [[paper link](#)]

- Singh, R., Li, K., & Principe, J.C. (2018). **Nearest-Instance-Centroid-Estimation Linear Discriminant Analysis**. In proceedings of 2018 IEEE International Conference on Acoustics, Speech and Signal Processing. [[paper link](#)]

COMPUTER SKILLS

- Programming:** Python, MATLAB, LaTeX. **Deep Learning Frameworks:** Keras, TensorFlow.

AWARDS

- University of Florida College of Engineering **Achievement Award** for New Engineering Graduate Students, 2016.