

## Wilka Torrico De Carvalho, *Aspiring Brain Scientist*

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### CONTACT INFORMATION

Website: [wcarvalho.github.io](http://wcarvalho.github.io)      Github: [github.com/wcarvalho](https://github.com/wcarvalho)  
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### RESEARCH INTERESTS

**Machine Learning:** Implicit Inference, Bayesian Nonparametric Models, Generative Models  
**Reinforcement Learning:** Value Estimation, Credit Assignment, Intrinsic Motivation  
**Computational Cognitive Science:** Stereotyping, Causality, Compositionality  
**Theoretical Neuroscience:** Neural Networks, Subsymbolic & Distributed Representations

### EDUCATION

**University of Michigan–Ann Arbor**, Ann Arbor, Michigan USA  
*School of Engineering*, Ph.D. in Computer Science & Engineering, May 2022

**University of Southern California**, Los Angeles, California USA  
*Viterbi School of Engineering*, M.S. in Computer Science, May 2017  
Advisor: [Yan Liu](#)

**Stony Brook University**, Stony Brook, New York USA  
*College of Arts and Sciences*, B.S. in Physics, May 2015  
Advisor: [Axel Drees](#)

**Brooklyn Technical High School**, Brooklyn, New York USA  
Diploma in Applied Physics, May 2011

### HONORS & AWARDS

GEM Fellowship sponsored by IBM, Adobe (declined)	2017, 2018
University of Michigan Rackham Merit Fellowship	2017
ICLR Travel Award	2017
NSF Graduate Research Fellowship (Neuroscience)	2015
Provost Award for Academic Excellence ( ~ 0.5% of graduates chosen)	2015
Researcher of the Month (1 school-wide per month)	2014
HHMI Minority Undergraduate Research Fellowship	2014
NSF Louis Stokes Alliance for Minority Participation Scholar	2011
Deans List	2011-2015
USA National Achievement Scholarship Finalist (top 5% nationally)	2011

### CONFERENCE PUBLICATIONS

Sanjay Purushotham\*, **Wilka Carvalho**\*, Tanachat Nilanon, Yan Liu. “*Variational Recurrent Adversarial Domain Adaptation.*” In 5th International Conference on Learning Representations (ICLR), 2017

Sanjay Purushotham\*, **Wilka Carvalho**\*, Yan Liu. “*Variational Adversarial Deep Domain Adaptation for Health Care Time Series Analysis.*” In 29th Annual Conference on Neural Information Processing Systems Workshop on Machine Learning for Healthcare (NIPS ML4HC), 2016 (**Spot-light**)

**Wilka Carvalho.** “*Modeling a Detection of internally reflected Cherenkov light (DIRC) Particle Detector for High-Multiplicity Collisions.*” In State University of New York Undergraduate Research Conference (SURC), 2015

### INVITED TALKS

Machine Learning Lunch Seminar. University of Southern California. (April, 2017)

SYMPOSIUM  
PRESENTATIONS

“Variational Adversarial Deep Domain Adaptation for Healthcare Time Series.” *Southern California Machine Learning Symposium*. California Institute of Technology, Pasadena, CA, 2016. **Runnerup, Best Poster. Worth \$1000 in Amazon AWS credit.**

“Modeling a DIRC Particle Detector for High-Multiplicity Collisions.” *23rd Annual CSTEP Statewide Student Conference*, Bolton Landing, NY, 2015. **2nd Place, Physics and Math.**

“Modeling the Cognitive Process of Attributing Traits to Others.” *Summer Seminar Day*. California Institute of Technology, Pasadena, CA, 2014.

“Modeling Deep Brain Stimulation of Globus Palidus Internus.” *22nd Annual CSTEP Statewide Student Conference*, Bolton Landing, NY, 2014.

“Modeling a Detection of internally reflected Cherenkov light (DIRC) Particle Detector for High-Multiplicity Collisions.” *URECA Celebration of Undergraduate Research & Creativity*. Stony Brook University, Stony Brook, NY, 2014.

“Modeling Deep Brain Stimulation of Globus Palidus Internus.” *Poster Symposium*. University of Minnesota, Minneapolis, MN, 2013.

RESEARCH  
EXPERIENCE

**IBM Almaden**, San Jose, California USA

**IBM Research**, *September 2017 – December 2017*

- Contributed to novel research algorithm by suggesting subspace projection technique that increased our performance from 15% to 95% accuracy. Designed and implemented environment for testing algorithm.
- Developed baseline and state-of-the-art neural networks using Tensorflow.
- Built data pipeline for large image dataset.

**Visa**, Palo Alto, California USA

**Visa Research**, *June 2017 – August 2017*

- Formulated a novel neural network for learning a language model.
- Implemented model and baselines for language generation and question answering using Tensorflow and Facebook’s ParlAI NLP software.
- Performed extensive literature reviews on machine reading comprehension and generative models.

**University of Southern California**, Los Angeles, California USA

**Melady Machine Learning Lab**, *November 2015 – May 2017*

- Implemented novel neural network that employed variational inference and adversarial training for transfer learning of multivariate time-series.
- Proposed analyses used in publications to empirically verify that our model (a) performed domain adaptation by creating domain-invariant representations and (b) transferred temporal dependencies across domains. Research led to 2 publications and a patent.
- Communicated research to general public through research feature by the USC Graduate School and to technical audience at ICLR poster presentation.

**Stony Brook University**, Stony Brook, New York USA

**Heavy Ion Research Group**, *January 2013 – August 2015*

- Built and maintained a simulator in C++ for the heavy ion particle detector at the Brookhaven National Laboratory.
- Contributed methods from multivariate calculus and linear algebra to particle detection algorithm. Accuracy improved from 60

- Designed and implemented a statistical analysis pipeline in C++ for measuring efficacy of particle detection algorithm.

**Sony Brook Univeristy**, Sony Brook, New York USA

**Computational Neuroscience Group**, *Fall 2014*

- Performed spectral analyses on neural data to determine behavioral correlates of neural activity.

**California Institute of Technology**, Pasadena, California USA

**Emotion and Social Cognition Laboratory**, *Summer 2014*

- Formulated a trait learning behavioral experiment to study human inference.
- Built online platform to administer psychology experiments using Javascript, PHP, and HTML.

**National Central, University**, Jhongli City, Taiwan

**Turbulent Combustion Laboratory**, *Summer 2012*

- Explored boundary layer conditions, and laminar and turbulent flow of fluids through pipes of varying cross-sections.

## TEACHING EXPERIENCE

**Sony Brook University**, Sony Brook, NY

**Calculus Instructor**, *Spring 2015*

Worked with two math professors to develop and teach a supplementary calculus curriculum that promoted minority representation in stem majors.

**Sony Brook University**, Sony Brook, NY

**Educational Opportunity Program Personal Tutor**, *Spring 2013 - Fall 2014*

Tutored marginalized students in introductory physics and math courses

## SERVICE

Student Volunteer, ICLR, 2017

## OUTREACH

*Research and Fellowships Week NSF Panel*, Los Angeles, CA, 2016

*National Society of Black Engineers Grad Panel*, Los Angeles, CA, 2016

*Graduate School External Fellowship Boot Camp*, Los Angeles, CA, 2016

*Engineering Graduate Diversity Symposium*, Los Angeles, CA, 2015

*Black Student Association: What it takes to go to Graduate School*, Los Angeles, CA, 2015

*Collegiate Science and Technology Entry Program Undergraduate Research Panel*, Sony Brook, CA, 2014

## SKILLS

Deep Learning Software: TensorFlow, Theano, Pytorch, Keras

Neuroscience Software: Neuron

Languages: Python, C++, C, Java

Systems: Unix, Linux, OSX

## PRESS

[Black History Month: Why a career in science?](#)

Research Feature by the USC Graduate School

[2015 NSF Graduate Research Fellow Wilka Carvalho](#)

[Biomath Learning Center Launches Modified Supplemental Instruction Program](#)

Research Feature by Sony Brook University

## INTERESTS

- traveling • chess • software development • improvisational dance • deadpan humor