DERY LUCIO

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EDUCATION

8/19 – present **Carnegie Mellon University**, **Pittsburgh PA**

- PhD in Computer Science

9/13 – 6/2018 **Stanford University**, **Stanford CA**

- MS in Computer Science (2016 - 2018) ** Tau Beta Pi
- BS in Physics + Minor in Computer Science (2013 – 2017) ** With Distinction

RESEARCH INTERESTS

- Natural Language Processing, Meta-Learning, Multitasking, Weak Supervision

PUBLICATIONS / PRESENTATIONS

Journal Papers

- **Dery, Lucio Mwinmaarong**, et al. "Weakly supervised classification in high energy physics." *Journal of High Energy Physics* 2017.5 (2017): 1-11 [Paper] [Code]

Conference Papers

- **Lucio M. Dery,** Paul Michel, Ameet Talwalkar, Graham Neubig. "Should We Be *Pre*-training? An Argument for End-task Aware Training as an Alternative" (under submission)
- **Lucio M. Dery**, Yann Dauphin, David Grangier. "Auxiliary task update decomposition: the good, the bad and the neutral". ICLR, 2021 [Paper][Code]
- D.A-Huang, Shyamal Buch, **Lucio Dery**, Animesh Garg, Li Fei-Fei, Juan Carlos Niebles. "Finding 'It': Weakly-Supervised Reference-Aware Visual Grounding in Instructional Video." CVPR, 2018 [Paper][Code]
- Eli Shlizerman, **Lucio Dery**, Hayden Schoen, Ira Kemelmacher. "Audio to Body Dynamics." *CVPR*, 2018 [Paper][Code]

Presentations

- 2017 International Workshop on *Advanced Computing and Analysis Techniques in Physics Research (ACAT)*, Poster Presentation
- 2017 Black In A.I Workshop. *Neural Information Processing Systems (NIPS)*, Poster Presentation

ACADEMIC RESEARCH

03/17 – 03/18 **Stanford Vision and Learning Lab: Unsupervised Understanding of Instructional Videos**

- Unsupervised extraction of task graphs from instructional videos
- Joint formulation and solution of Reference Resolution and Visual Grounding in instructional videos

01/17 – 03/17 **Stanford Vision and Learning Lab: Unsupervised Segmentation and Localization in Video Demonstrations**

- Used latent structure of videos of the same task to learn optimal temporal segmentation into subtasks
- Combined Convolutional Auto encoder with clustering algorithm to produce video segmentation proposals.
- Discovered Longest Common Subsequence (LCSS) across multiple video segmentations by augmenting multidimensional LCSS algorithm with Dynamic Time Warping.
- Created an End-To-End trainable unsupervised pipeline that utilized learned LCSS across videos to update representations learned by Convolutional Auto Encoder.

09/ 16 – 02/17 **SLAC National Accelerator Laboratory: Weakly Supervised Classification In High Energy Physics**

- Developed a weakly supervised deep learning algorithm whose only input is class proportions in different distribution regimes instead of individual labels.
- Matched the performance of Fully Supervised network on Quark-Gluon Tagging discrimination task.
- Currently extending work to higher dimensional data: image representations of Particle Collider energy deposits

3/16 – 09/16 **SLAC National Accelerator Laboratory: CNNs for Discriminating Higgs Boson Production Mechanisms**

- Converted Vector Boson Fusion (VBF) and Gloun-Gloun Fusion (GGF) event data into image representations that could be analyzed and fed into any computer vision-based algorithm for classification.
- Designed residual convolutional network architecture to discriminate between GGF and VBF events
- Established the presence of new physics outside of current widely used HTSoft marker that can be used to discriminate the two event types.

INDUSTRY EXPERIENCE

6/20 – 8/20 **Research Intern, Google Brain – Google**

- Leveraging out-of-distribution data via Gradient Alignment

- Examine auxiliary task gradients within subspace spanned by primary task gradients

7/18 – 7/19 **Research Engineer, Facebook A.I Research – Facebook**

- Learning Neural Knowledge Graphs by Generating Wikipedia
- Probing Commonsense and World Knowledge Capabilities of State-of-the-Art Co-reference Models
- Open-sourced Audio to Body Dynamics
- Contributed to FAIRSEQ

6/17 – 8/17 **Software Engineering Intern, Applied Machine Learning - Facebook**

- Audio-Visio Multimodal Learning for understanding human mannerisms
- Developed recurrent architecture for learning transformations from audio features to body keypoints

6/16 – 8/16 **Software Engineering Intern, Terra Bella - Google**

- Applied unsupervised learning techniques to Satellite images to cluster similar socio-economic regions and detect changing regions over time
- Extensive feature engineering through experimentation with remote sensing signal spaces like NDVI (Normalized Difference of Vegetation Index), MSAVI and NDBI
- Built Tensor Flow model that utilized Inception V3 featurization of remote sensing signal spaces to automatically identify similar regions like Golf Courses or Airports within and across cities.

6/15 – 9/15 **Engineering Practicum Intern, Google Analytics**

- Conducted background experimentation and comparative performance visualizations in R on time series prediction algorithms in Analytics libraries against third party algorithms.
- Implemented Autoregressive Integrated Moving Averages (ARIMA) time series forecasting. Resulting implementation was on average faster than R implementation and of comparable accuracy.
- Exposed ensemble mode API that allows developers to use suite of forecasting algorithms.

TEACHING EXPERIENCE

- Computer Vision Instructor, African Masters in Machine Intelligence , Summer 2019
- Head Teaching Assistant, Deep Learning (CS230) Stanford University, Spring 2018
- Course Assistant, Deep Learning (CS230), Stanford University, Winter 2018
- Course Assistant, Machine Learning (CS229), Stanford University, Autumn 2017
- Summer School Instructor, Enza Academy, Summer 2015
- Section Leader, Programming Methodology (CS106A), Stanford University, 2014 - 2017
- Section Leader, Programming Abstractions (CS106B), Stanford University, 2014 - 2017

SKILLS

- IDEs/Tools: Sublime, Nuclide, TensorFlow, Pytorch.
- Programming Languages: Python, C++, C, R, Java, Objective C, Matlab

HONORS/AWARDS

- Member, Stanford Chapter Tau Beta Pi Engineering Honor Society
- Stanford Black Community Center Award for Academic Excellence
- Stanford Center for African Studies Leadership and Service Award
- 3rd Best Student, West African Senior Secondary Certificate Examination (out of over 2.5 million students from Anglophone West Africa in 2013)
- 2nd Place, Ghana National Math and Science Olympiad (out of 32 Selected Schools)