

# DERY LUCIO

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Github: <https://github.com/ldery>

## 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, Computer Vision, Machine Learning, 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

- 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 TimeWarping.
- 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 Gluon-Gluon 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**

- Improving Out-of-Distribution Training via Gradient Alignment

### 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**

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- ☐ 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
- ☐ Section Leader, Programming Methodology (CS106A), Stanford University, 2014 - 2017
- ☐ Section Leader, Programming Abstractions (CS106B), Stanford University, 2014 - 2017
- ☐ Summer School Instructor, [Enza Academy](#), Summer 2015

### **SKILLS**

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- ☐ Programming Languages: Python, C++, C, R, Java, Objective C, Matla.
- ☐ IDEs/Tools: Sublime, Nuclide, QT-Creator, Xcode, gdb, valgrind, perf, Android Studio, Hadoop, TensorFlow, Pytorch.

### **HONORS/AWARDS**

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- ☐ 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
- ☐ 3<sup>rd</sup> Best Student, West African Senior Secondary Certificate Examination (out of over 2.5 million students from Anglophone West Africa in 2013)
- ☐ 2<sup>nd</sup> Place, Ghana National Math and Science Olympiad (out of 32 Selected Schools)