

# NILS MURRUGARRA

[nineil.cs@gmail.com](mailto:nineil.cs@gmail.com) 412-304-6655 <http://cs.pitt.edu/~nineil/>

## SUMMARY

Expert in computer vision, machine learning, and natural language processing using different programming languages like C++, java, python and web technologies as PHP, HTML, JavaScript, andmysql. In addition, experienced in research, programming and teaching.

## EDUCATION

University of Pittsburgh, Pittsburgh, PA	2012 - 2019
Doctorin Computer Science, Computer Vision	GPA: 3.8
Universityof São Paulo, São Carlos, SP, Brazil	2009 - 2011
Master in Computer Science, Machine Learning	GPA: 4.0
NationalUniversity of Trujillo, Trujillo, Peru	2004 - 2009
Bachelor in Computer Science	GPA: 3.6

## SKILLS

**Programming languages:** Python, R, Java, C/C++, Matlab, android SDK, Prolog, and Scheme

**Tools:** tensorflow, theano, keras, caffe, github, weka, liblinear, libsvm, scikit-learn library, slim, amazon mechanical turk

**Scripts:** HTML, PHP, JSP, JavaScript, linux shell

**Technologies:** deep learning, reinforcement learning, transfer learning, metric learning, PCA, LDA.

**IDEs:** NetBeans, PyCharm, Eclipse, Visual C++

**Databases:** SQL, MySQL, PostgreSQL

## RELEVANT GRADUATE COURSES

- Machine learning
- Natural language processing
- Pattern recognition
- Advanced machine learning
- Advanced artificial intelligence (Computer vision)

## PROFESSIONAL EXPERIENCE

### Snap Inc, Los Angeles, CA, USA.

#### Research scientist

Nov 2019 - present

- Developed prototypes to find data insights using machine learning and computer vision.
- Worked on data collection, annotation, and model learning.

### ASEA Brown Boveri (ABB), Raleigh, NC, USA.

#### Deep learning intern

May - Jul 2017

- Automatized image industrial application from model training on a GPU server to deployment in a Raspberry PI.
- Improved accuracy from 80% to 90% on rusty hazard recognition. Presented results to managers and stakeholders in the company.
- Worked on data collection, annotation, model training, evaluation, and deployment.

### Educational Testing Service (ETS), Princeton, NJ, USA.

#### Research intern

Jun - Jul 2014

- Contributed new features to manage big data, reduce memory consumption and work with imbalance data for the open source machine learning [SKLL](#) platform, widely employed in ETS.
- Made possible the use of a big prepositional dataset (4 GB) for machine learning and natural language techniques.

### Computer Science Student Society, Trujillo, Peru.

#### Software developer

Apr-Jun 2009 / Apr-Sep 2010

- Developed a web platform for Automatic Programming Contests (codeSECC) and a web platform for online exams with automatic grading. All these projects were developed using PHP, javascript, andmysql.
- Platform used for the I Peruvian Programming Contest.

## RESEARCH EXPERIENCE

### Laboratory of Computer Vision, University of Pittsburgh, Pittsburgh, PA, USA.

#### Research assistant

Jan 2015 - Current

- Conceived, developed and implemented new algorithms in computer vision, deep learning, and reinforcement learning.
- Published four articles in highly ranked computer vision and machine learning conferences.

### Laboratory of Computational Intelligence, University of São Paulo, São Carlos, SP, Brazil.

**Research assistant**

Aug 2009 - Sep 2011

- Conceived, developed and implemented a new graph-based machine learning classifier.
- Developed a platform for machine learning experiments using the Java, weka and netkit.
- Wrote and published four articles for conferences in Greece, Brazil, and Peru.

**SELECTED PROJECTS****Cross-modality personalization for retrieval (2018)**

Developed a model for study how a person's way of looking at an image (gaze) affects the way they describe it (captioning). Improved accuracy [Python, tensor-flow and slim]

**Image retrieval with mixed initiative and multimodal feedback (2018)**

Developed an image retrieval system using reinforcement learning to combine: drawing a sketch, providing free-form attribute feedback, or answering attribute-based questions. Improved accuracy on simulated and live users [Python, keras, theano, and tensor-flow]

**Non-semantic attribute transfer (2017)**

Developed a non-semantic transfer approach from attributes in different domains. Improved accuracy, interpretability and analysis. [Python, keras, theano, and caffe]

**Learning attributes from human gaze (2016)**

Developed and evaluated how to involve humans more directly in learning attribute models through gaze maps. Improved accuracy, visualization and attribute understanding [Matlab, python, and caffe]

**NLP projects (2011-2013)**

Developed an automatic student answer grading system, a language identification system and a comparison tool for collegiate computing curriculums. NLP techniques include bag-of-words, latent semantic analysis, unigrams, bigrams, trigrams and hierarchical clustering. [Python, java, and R]

**Face recognition using PCA, LDA and spectral clustering (2014)**

Developed a face recognition system using PCA, LDA and Spectral clustering. [Python and Scikit-learn library]

**Automatic isolated words speech recognizer (2009)**

Developed a tool for automatic speech recognition using ten spoken digits. Achieved accuracy higher than 95%. [Java]

**Feature selection in stock market prediction (2012)**

Developed a tool to explore feature selection in the problem of stock market prediction. Feature selection achieved similar performance than whole features [R]

**PUBLICATIONS**

1. **N. Murrugarra-Llerena** and A. Kovashka. *Involving humans to learn attributes*. In LatinX in AI research workshop. Thirty-third Conference on Neural Information Processing Systems (**NeurIPS**), Vancouver, Canada, 2019.
2. **N. Murrugarra-Llerena** and A. Kovashka. *Cross-modality personalization for retrieval*. In Computer Vision and Pattern Recognition (**CVPR**), 2019. (oral)
3. **N. Murrugarra-Llerena** and A. Kovashka. *Asking friendly strangers: non-semantic attribute transfer*. In LatinX in AI research workshop. Thirty-six International Conference on Machine Learning (**ICML**), 2019.
4. **N. Murrugarra-Llerena** and A. Kovashka. *Image retrieval with mixed initiative and multimodal feedback*. In LatinX in AI research workshop. 32<sup>nd</sup> Conference on Neural Information Processing Systems (**NeurIPS**), 2018.
5. **N. Murrugarra-Llerena** and A. Kovashka. *Image retrieval with mixed initiative and multimodal feedback*. In British Machine Vision Conference (**BMVC**), 2018. (oral)
6. **N. Murrugarra-Llerena** and A. Kovashka. *Asking friendly strangers: non-semantic attribute transfer*. In 32<sup>nd</sup> AAAI Conference on Artificial Intelligence (**AAAI**), 2018.
7. **N. Murrugarra-Llerena** and A. Kovashka. *Learning attributes from human gaze*. In IEEE Winter Conference on Applications of Computer Vision (**WACV**), 2017.
8. C. González-Cadenillas and **N. Murrugarra-Llerena**. *Isolated words recognition using a low-cost microcontroller*. In III Brazilian Symposium on Computational Systems Engineering (**SBESC**), 2013.
9. **N. Murrugarra-Llerena**, L. Berton, and A. de Andrade Lopes. *Graph-based cross-validated committee ensembles*. In 2012 Fourth International Conference on Computational Aspects of Social Networks (**CASoN**), 2012.
10. **N. Murrugarra-Llerena** and A. de Andrade Lopes. *An adaptive graph-based k-nearest neighbor*. In CoLISD: Collective Learning and Inference on Structured Data, 2011. European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (**ECML-PKDD**).
11. **N. Murrugarra-Llerena** and A. de Andrade Lopes. *A graph-based bagging*. In CoLISD: Collective Learning and Inference on Structured Data, 2011. European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (**ECML-PKDD**).
12. **N. Murrugarra-Llerena**, F. Alva-Manchego, and S. Oliveira Rezende. *Comparison of computing curriculums using text hierarchical clustering*. In XXXI Congress of the Brazilian Computer Society (**CSBC**), 2011.

**HONORS AND AWARDS**

**Doctoral consortium travel grant** (mentoring program). Computer Vision and Pattern Recognition (CVPR). USA (Jun 2019)

**Art and science full merit fellowship** (A&S). University of Pittsburgh, USA. (Sep-Dec 2012)

**IMPA fellowship** (Summer Course). National Institute of Pure and Applied Mathematics (IMPA), Brazil. (Jan - Feb 2012)

**Honorable mention.** ACM - International Collegiate Programming Contest (ACM-ICPC), Coach. Peru. (Nov 2011)

**PAE fellowship** (Education Improvement Program). University of São Paulo, Brazil. (Feb - Jun 2011)

**Master fellowship.** University of São Paulo, CNPQ, Brazil. (Aug 2009 – Aug2011)

**1st place in undergraduate studies** in Computer Science. National University of Trujillo, Peru. (2004–2009)

**1st place in the 3rd Computer Programming Marathon.** National University of Trujillo, Peru (Sep 2005)

**Six travel awards** to conferences including ICML, NeurIPS, AAAI, Latam and SPAS-eScience from 2012 to 2019.