NILS MURRUGARRA

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SUMMARY

Knowledgeable in different programming languages like C++, java, python and web technologies as PHP, HTML, JavaScript, and mysql. In addition, experienced in research, programming and teaching activities. Research areas include machine learning, natural language processing, and computer vision.

EDUCATION

University of Pittsburgh, Pittsburgh, PA	Expected Graduation: Dec 2018
Doctor in Computer Science	GPA: 3.8
University of São Paulo, São Carlos, SP, Brazil	2009 - 2011
Master in Computer Science	GPA: 4.0
National University of Trujillo, Trujillo, Peru	2004 - 2009
Bachelor in Computer Science	GPA: 3.6

THECNICALSKILLS

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

IDE's: NetBeans IDE, Eclipse, Visual C++, Code Blocks

Databases: SQL, MySQL, PostgreSQL

Scripts: HTML, PHP, JSP, JavaScript

Tools: tensorflow, theano, keras, caffe, github, weka, liblinear, libsvm, scikit-learn library

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

RELEVANT GRADUATE COURSES

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

PUBLICATIONS

1. Image retrieval with mixed initiative and multimodal feedback. **N. Murrugarra-Llerena** and A. Kovashka. In Proceedings of the British Machine Vision Conference (BMVC), Newcastle upon Tyne, United Kingdom, 2018. Springer. **(oral)**

2. Asking friendly strangers: non-semantic attribute transfer. **N. Murrugarra-Llerena** and A. Kovashka. In Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence (AAAI), New Orleans, Lousiana, USA, 2018. AAAI.

3. Learning attributes from human gaze. **N. Murrugarra-Llerena** and A. Kovashka. In Proceedings of IEEE Winter Conference on Applications of Computer Vision (WACV), Santa Rosa, California, USA, 2017. IEEE.

4. Isolated words recognition using a low-cost microcontroller. C. González-Cadenillas and **N. Murrugarra-Llerena**. In Proceedings of the III Brazilian Symposium on Computational Systems Engineering (SBESC), pages 77–82, Niteroi, RJ, Brazil, 2013. IEEE.

5. Graph-based cross-validated committee ensembles. **N. Murrugarra-Llerena**, L. Berton, and A. de Andrade Lopes. In Proceedings of the 2012 Fourth International Conference on Computational Aspects of Social Networks (CASoN), pages 75–80, São Carlos, SP, Brazil, 2012. IEEE.

6. An adaptive graph-based k-nearest neighbor. **N. Murrugarra-Llerena** and A. de Andrade Lopes. In Proceedings of the CoLISD: Collective Learning and Inference on Structured Data, pages 37–48, Atenas, Greece, 2011. European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD).

7. A graph-based bagging. **N. Murrugarra-Llerena** and A. de Andrade Lopes. In Proceedings of the CoLISD: Collective Learning and Inference on Structured Data, pages 25–36, Atenas, Greece, 2011. European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD).

8. Comparison of computing curriculums using text hierarchical clustering. **N. Murrugarra-Llerena**, F. Alva-Manchego, and S. Oliveira Rezende. In Proceedings of the XXXI Congress of the Brazilian Computer Society (CSBC), pages 1616–1625, Natal, RN, Brazil, 2011. Brazilian Computer Science Society.

9. 3D surface reconstruction applied to medical imaging. **N. Murrugarra-Llerena**, O. Fernandez-Asunción, and L.

Castañeda-León. In Proceedings of the VII Peruvian Conference on Computing (JPC-2008), pages 210–221, Lima, Peru, 2008. Peruvian Computer Science Society.

10. Detection of fish eye disease in olives using graphics processing. F. Carranza-Athó and **N. Murrugarra-Llerena**. In Proceedings of the VI Peruvian Conference on Computing (JPC-2007), pages 171–179, Trujillo, Peru, 2007. Peruvian Computer Science Society.

RESEARCH EXPERIENCE

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%.
- Worked on data collection, annotation, model training, evaluation, and deployment.
- Presented results to managers and stakeholders in the company.

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

Research assistant   Jan 2015 - Current
- Conceived, developed and implemented new algorithms in computer vision. Currently, working with deep learning, and reinforcement learning.
- Submitted articles for revision in international conferences.

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

Research intern   Jun - Jul 2014
- Contributed new features for the machine learning SKLL platform, employed widely in ETS.
- Contributed new features to manage big data, reduce memory consumption and work with imbalance data.
- Evaluated a big prepositional dataset (about 4 GB) to determine the best preposition given its context using Machine Learning and Natural Language Processing techniques (previously it wasn't possible).

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 machine learning classifier
- Developed a platform for machine learning experiments using the java programming language and the tools: weka and netkit
- Wrote and published four articles for conferences in Greece, Brazil, and Peru

PROFESSIONAL EXPERIENCE

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, and mysql
- Platform used for the I Peruvian Programming Contest

PROJECTS

Image retrieval with mixed initiative and multimodal feedback (2018)

Developed a mixed-initiative framework using reinforcement learning. Our reinforcement agent decides dynamically which interactions are beneficial: drawing a sketch, providing free-form attribute feedback, or answering attribute-based questions. Hence, our system allows faster image retrieval. We outperform three baselines on three datasets with simulated and live users. This project was implemented with python, keras, theano, and tensor-flow.

Non-semantic attribute transfer (2017)

Developed and evaluated a non-semantic transfer approach from attributes in different domains. We developed an attention-guided transfer architecture that improves accuracy among five baselines on 272 attributes from five different domains. We also analyze and interpret our model via attention weights and interpretable attribute relations. This project was implemented with 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. Compared to six baselines, we improve prediction accuracies. We developed two applications: visualization of attribute models and learning "schools of thought" between users in terms of their understanding of attributes. This project was

developed with matlab, python, and caffe.

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

Developed a face recognition system using the Labeled Face in the Wild dataset. It was applied different space transformation techniques as PCA, LDA and Spectral Clustering achieving a good evaluation on the test dataset. It was implemented in python with help of scikit-learn machine learning library.

Automatic grading system (2013)

Developed a student answer grading system that can give a suitable grade according to student answers with several natural language processing (NLP) techniques; included bag-of-word, latent semantic analysis (LSA) and textual entailment using Python and Java languages.

Automatic language identification using n-grams (2013)

Developed a language identification system (German, Spanish or English) using unigrams, bigrams, and trigrams with a perplexity measure. It was implemented in python language.

Semi-automatic comparison of collegiate computing curriculums (2011)

Developed a tool to compare different computing undergraduate curriculums based on their courses using bag-of-words a hierarchical clustering. It generated a dendrogram graph and needs a specialist to analyze and determine what careers are similar or not. It was implemented in R.

Automatic isolated words speech recognizer (2009)

Developed a tool for automatic speech recognition using ten spoken words for digits. It was implemented using Fourier transform, dynamic time wrapping, Mel cepstrum features, and others. In the experiments, we consider 10 different persons and the accuracy was higher than 95% using cross-validation procedure. It was implemented in Java.

Feature selection in stock market prediction (2012)

Developed a tool to explore feature selection in the problem of stock market prediction. It was used data from the yahoo finance site. Also, the predictor was selected with a tuning for the SVM classifier and then applied feature selection procedures. The results achieved was that using fewer features we achieved a similar performance that using all the features. Also, it was verified with a t-test procedure. It was implemented in R.

HONORS AND AWARDS

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

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

Honorable mention. ACM - International Collegiate Programming Contest (ACM-ICPC) South America/South Regional Contest, Coach, ACM-ICPC. Lima, Peru. (Nov 2011)

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

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

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

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

Travel award. Thirty-Second AAAI Conference on Artificial Intelligence, AAAI, New Orleans, LA, USA (Feb 2018)

Travel award. Latin American eScience Workshop (latam), FAPESP, São Paulo, SP, Brazil. (May 2013)

Travel award. São Paulo School of Advanced Science on e-Science for Bioenergy Research (SPAS-eScience), FAPESP, Campinas, SP, Brazil. (Oct 2012)