

Ronald A. Cardenas

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RESEARCH INTERESTS

- Natural Language Processing: syntactic and semantic parsing, cross-lingual models, statistical machine translation, topic modeling.
- Machine learning: probabilistic graphical models, high-dimensional learning, structured prediction, active learning, deep learning, learning representations, optimization.
- Interactive data visualization.

CAREER GOAL

To become a fully-fledged XXI century scientist: a scientist with a truly multidisciplinary training, one capable of running a laboratory with students of different disciplines and appropriately integrate their skills to produce cutting-edge research for the benefit of society.

EDUCATION AND RESEARCH SUMMER SCHOOLS

B.S. Mechatronics Engineering (Robotics) August 2009 - July 2015
Universidad Nacional de Ingenieria, Lima, Peru.

- Summa Cum Laude
- Research Advisor: Alberto Coronado

Machine Learning Summer School Kyoto - 2015 August 2015
Kyoto University. Kyoto, Japan.

LxMLS: Lisbon Machine Learning Summer School 2014: Learning with Big Data July 2014
Instituto Superior Tecnologico. Lisbon, Portugal.

Summer School for Competitive Programming Olympiads: Maratona do Programacao January 2013
Universidade Estadual de Campinas. Sao Paulo, Brasil.

PUBLICATIONS AND POSTER SESSIONS

R.A. Cardenas, K.S. Bello, A.R. Valle, E.R. Villota and A.M. Coronado. "Panorama of the market demand for Mechanical Engineers in South American Countries". *Proceedings of the 2015 ASME International Mechanical Engineering Congress and Exposition (IMECE2015): Volume 5, Engineering Education and Professional Development* [to appear].

R.A. Cardenas, K.S. Bello and A.M. Coronado. "Labor market demand analysis for engineering majors in Peru using Shallow Parsing and Topic Modeling", *Machine Learning Summer School Poster Session, Kyoto, Japan, August, 2015*.

A.R. Valle, K.S. Bello, **R.A. Cardenas**, E.R. Villota and A.M. Coronado. "Analysis of the Peruvian labor market demand in the area of mining maintenance". *Proceedings of the 2nd International Seminar on mining plant and equipment maintenance (MAPLEMIN 2015), Lima, Peru, July, 2015*.

ACHIEVEMENTS, HONORS AND AWARDS

- INIFIM - Research Institute of the Mechanical Eng. Department: Research Grant \$2500 2015
- Universidad Nacional de Ingenieria: Grant for attendance to MLSS Kyoto \$1500 2015
- Universidad Nacional de Ingenieria: Grant for attendance to LxMLS \$1000 2014
- CONCYTEC - Peruvian Science and Technology Research Grant \$800 2013
- Dean's List 2012-2014
- 7th and 5th place in ACM-ICPC South American Regional Contest by IBM 2012,2014
- 11th Place, IEEEExtreme World Wide Programming Competition 2013
- 1st Place, IEEEExtreme - INTERCON National Programming Contest 2012

RESEARCH EXPERIENCE

INIFIM - Mechanical Engineering Department Research Institute, Lima, Peru

Universidad Nacional de Ingenieria

January 2014 - (to date)

I worked in Machine Learning and Natural Language Processing over Spanish corpora. The project consisted in analyze the relationship between professional majors in the industry regarding only requirements requested in job ads published in Peruvian job-hunting websites.

I experimented with Latent Dirichlet Allocation, analyzing the effect of inference algorithms (Variational Expectation Maximization and Gibbs Sampling) and the amount of information per document fed to the topic model. This experiment setup consisted in comparing models with the whole document's text and those only with text chunks extracted by applying Shallow Parsing beforehand. The results showed that text chunks allow convergence to a way more meaningful minimum in the number of topics in the models over log-likelihood of held-out data, as well as showing clusters of professional majors highly related by the requirements requested by industry.

The shallow parser implemented was a Structured Perceptron trained over manually annotated data, achieving 91% F1 score in average.

The project also required me to implement automated web data extractors (spiders) and the design and maintenance of relational databases for its storage.

This work was under the supervision of Prof. Alberto Coronado.

Artificial Intelligence & Control Systems Research Laboratory, Lima, Peru

Mechanical Eng. Dept., Universidad Nacional de Ingenieria

August 2013 - (to date)

I worked in Robotics and Control Systems, implementing Simultaneous Localization and Mapping (SLAM) techniques, and path planning algorithms to mobile robots. The project involved simulation as well as physical implementation on HPI Racing Buggy and iRobot Create models. The software used was mainly MatLab and ROS. This project was under the supervision of Professors Ivan Calle and Ricardo Rodriguez. In addition, I worked in interactive data visualization for websites, loading data from relational and non-relational databases. This work was under the supervision of Prof. Alberto Coronado.

TEACHING AND RESEARCH MENTORING

Artificial Intelligence & Control Systems Research Laboratory (GISCIA), Lima, Peru 2014-2015

- Vice-president of GISCIA, organizing seminars, workshops and talks introducing undergraduates to research projects in Machine Learning.
- Training coach of undergraduate students teams for competitive programming contests.

PROGRAMMING & SOFTWARE

- *Programming Languages:*
Python, C/C++, Java, R, Matlab, JavaScript, Shell scripting.
- *Operating Systems:* Linux (Ubuntu, ArchLinux), Windows and Mac OSX.

LANGUAGES

English: Professional proficiency

Spanish: Native

Portuguese: Elementary proficiency

Japanese: Elementary proficiency

EXTRA-CURRICULAR ACTIVITIES

- Violin performer at ACyM Orchestra da Camera at Miraflores, Lima, Peru. 2009 - to date
- Violin performer at National Youth Symphony Orchestra of Peru. 2006 - 2009