# Felipe Pérez

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## SUMMARY

Data Scientist with a Ph.D. in mathematics, proficient in data mining, supervised and unsupervised machine learning techniques, including extensive knowledge in deep learning. Strong programming skills, with expertise in Python and Scala.

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## TECHNICAL SKILLS

**Programming Languages:** Python (TensorFlow, Pandas, Scikit-learn, Numpy, Scipy, Matplotlib) | SQL | Scala | Spark | LaTeX |

**Machine Learning:** | Deep Learning | Classification | Regression | XGBoost | Random Forest | K-Means | Naïve Bayes | GLM | Natural Language Processing | ARIMA | SVM | SVC

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## PROFESSIONAL DEVELOPMENT

**Project Highlights**

- Built a model to predict the sales rank of products from the Amazon reviews dataset. The model was built by engineering features via comprehensive approaches, including sentiment analysis of the reviews, as well as statistics on the number of cumulative reviews. These features were fed to an XGBoost model with fine-tuned hyperparameters for better accuracy. The project was a finalist in the Hackon(Data) competition 2017.
- Designed NLP projects ranging from vector embedding models to text generation. Models built by means of deep neural networks using TensorFlow. These projects are part of a NLP talk series that I have been giving since June 2017.
- Built deep learning models for ArXiv Abstracts text classification, including a convolution neural network and a space-embedding model followed by dense layers (ongoing).
- By using bayesian techniques, successfully modeled the gating mechanism of *Thermoplasma acidophilum* proteasome core particle with a high level of precision. This was a joint project with a top-level biophysics laboratory in University of Toronto.
- Implemented random walk model to simulate molecular interaction in a confined finite space.

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## PROFESSIONAL EXPERIENCE

**Postdoctoral Researcher, Georgia State University**      **2015.8 – 2017.5**

Conducted research in Algebraic Geometry and Commutative Algebra, and gave math courses:

- Produced three papers published in top journals, *e.g.,* Transactions of the American Mathematical Society, on the topic of the behavior of singularities.

**GSI, University of Michigan.**      **2009.8 – 2015.5**

Conducted research and taught undergraduate-level classes:

- Produced four papers on the topic of singularities published in top journals (e.g., Journal of Algebra).
- Taught eight undergraduate-level math classes, including differential, integral, and several variable calculus, linear algebra, and received great student evaluations.

## HONORS AND GRANTS (Selected)

- HackerRank 97th percentile Algorithms, 3 silver and 1 bronze medals, 2015-2017.
- The Pat Shure Excellence in Teaching Award, 2015.
- Michigan Mathematics Graduate Fellowship, 2009-2015.
- Alice Webber Glover Fellowship, Summer 2011.
- Master Fellowship from Mazda Foundation for Arts and Science, 2007-2009.
- Third Prize International Math Competition, 2005.

## EDUCATION

**University of Michigan**                                                                 **2009.8 - 2015.5**
**Ph.D., Mathematics.**
Thesis: Comparing invariants between positive and zero characteristic singularities.

**Universidad Nacional de Colombia**                                                       **2007.1 - 2009.4**
**Master, Mathematics.**
Thesis: On Koh's Conjecture.

**Universidad Nacional de Colombia**                                                       **2003.1 - 2006.12**
**B.S., Mathematics.**

## PUBLICATIONS (Selected)

- R. Huang, **Pérez, F**, "Probing the cooperativity of Thermoplasma acidophilum proteasome core particle gating by NMR spectroscopy", 2017. *Proceedings of the National Academy of Sciences* (under revision).
- D. Hernández*, L. Núñez-Betancourt*, **F. Pérez***, and E. Witt*, "Lyubeznik numbers and the injective dimension of local cohomology modules in mixed characteristic", 2017. *Transactions of the American Mathematical Society*. (In press). *Shared first authorship.
- A. De Stefani*, L. Núñez-Betancourt*, and **F. Pérez***, "On the existence of F-thresholds and related limits", 2017. *Transactions of the American Mathematical Society*. (In press) *Shared first authorship.
- L. Núñez-Betancourt*, **F. Pérez***, "F-jumping and F-Jacobian ideals for hypersurfaces.", 2016. *Journal of Pure and Applied Algebra.* *Shared first authorship.
- **Pérez, F**. "On the constancy regions for mixed test ideals", 2013. *Journal of Algebra.*