

# Carlos Salinas

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## EDUCATION

### Purdue University, West Lafayette, IN

Aug. 2020

*Master of Science in Mathematics*

GPA: 3.73/4.0

### University of Texas–Pan American, Edinburg, TX

May 2014

*Bachelor of Science in Mathematics*

GPA: 3.86/4.0

## EXPERIENCE

### Graduate Student/Teaching Assistant

Aug. 2014 – May 2020

*Department of Mathematics at Purdue University, West Lafayette, IN*

- Led two to three recitation sections per semester for undergraduate math courses, including Calculus 1, 2, 3, and Differential Equations/Linear Algebra.
- Graded homework, wrote quizzes, and proofread exams for several undergraduate courses, including Calculus 1, 2, 3, Differential Equations and PDEs for Engineering and the Sciences, and Advanced Mathematics for Physicists and Engineers.
- Created a university-hosted website to upload relevant course material such as quiz and homework solutions, recitation notes, and course statistics with Jekyll.
- Studied the zeta function associated to finite quotients of the finitely generated free nilpotent group.

### Undergraduate Research Assistant/System Administrator

Sep. 2013 – May 2014

*Experimental Algebra & Geometry Lab at the University of Texas–Pan American, Edinburg, TX*

- Operated the lab's Fedora workstation cluster which included updating and installing software, managing users and user permissions, keeping track of workstation usage, and updating the lab's WikiDot-powered website.
- Configured the lab's Nvidia GPU for usage with Mathematica's CUDALink and trained interested students how to use it.
- Operated the lab's 3D printer, updated its software, and kept it in shape for use in Dr. Lawton's outreach activities.
- Wrote an algorithm in Mathematica to study the trace representations of 2-special words taking advantage of trace identities to reduce the size of search space.
- Discovered a correspondence between 2-special words and orientable necklaces, published in the On-line Encyclopedia of Integer Sequences A237623.

## PRESENTATIONS

### Superpositions of a Sigmoidal Function

Feb. 6, 2019

*Machine Learning Reading Group, Purdue University*

- Introduced the audience to a foundational result in Universal Approximation Theory.
- Introduced the results and language necessary to prove that sigmoids can approximate any continuous function.
- Proved that ReLUs are *discriminatory* and therefore universal approximators.

### Observations

June 2020

*Data Science Bootcamp at University of Chicago at Urbana-Champaign*

- Wrote an RMarkdown notebook to analyze book ratings on a subset of GoodReads' database.
- Performed linear regression to model the popularity of prolific authors.
- Performed ANOVA on the data to get an overview of the different features of the data and how they relate to the *popularity* of a given author.

## SKILLS

**Languages:** Python, C, R, Java, Matlab

**Developer Tools:** Git, Emacs, Vim, Eclipse

**Python Libraries/Frameworks:** pandas, NumPy, matplotlib, scikit-learn, Keras, NLTK, spaCy

**R Libraries/Frameworks:** tidyverse, tidymodels,forcats, mlr, shiny

**Misc. Software:** SQL (Postgre), LaTeX, Linux, Mathematica, Microsoft Office (Word, Excel, Outlook, PowerPoint)

**Natural Languages:** English (native), Spanish (native), Russian (fluent), Persian (conversant), French (proficient)