

# Alejandro Aguilar

Email: [aa109@rice.edu](mailto:aa109@rice.edu)

Phone: (956) 463-3007

## INDUSTRY EXPERIENCE

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- Jun 2018-Aug 2018 **NASA Johnson Space Center** Houston, TX  
*Summer Intern*  
Identified, applied, and developed statistical methods for an exploratory analysis in regard to SANS, a physiologic and pathologic system and neuro-ocular response in the astronaut population. Scripted with R for statistical and data analysis. Presented results to mentors and the epidemiology community.
- Sept 2015-Aug 2017 **IDEA Public Schools** Weslaco, TX  
*Student Information Systems Data Analyst*  
Collaborated directly and gather functional reporting requirements from school administration, organizational leadership, and other departments to provide dynamic data visualization and accurate data for state data submissions, tracking mechanisms, reports, educational grants, endowments, and other cash donations (ranging from \$2.5K to \$20 M). Validated and audit student data for 100% accuracy. Wrote queries in Oracle SQL Developer for extracting data and updating reports on PowerSchool (student information system). Utilized SPSS and R for statistical analysis, linear regression, correlation, and forecasting (time series analysis-ARIMA model) using student demographics, student enrollment numbers, student courses, and student attendance data. Presented results in tabular and graphical representations as well as in a verbal, written, and analytical manner to individuals, departments, school staff and administration, and senior management. Developed simple dashboards in Visual Studio with C#, HTML, and JavaScript to present data in an accurate, easy to understand, and efficient manner for all school and organizational stakeholders. Designed a four year historical analysis of cumulative student attendance with Excel VBA by school, region, and grade level for principals, assistant principals, and organizational leadership.
- Sept 2008-Sept 2015 **ADL Services, Inc.** Weslaco, TX  
*Economist/Accounting and Operations Coordinator*  
Researched local, state, and national healthcare trends. Designed databases and wrote simple VBA programs for data management. Collected data, performed statistical analysis, generated charts, and presented results to senior management. Worked directly with key senior managers in preparing annual cost reports, forecasting annual growth, establishing processes for company efficiency, and ad-hoc/special projects. Created instruction manuals and trained employees on new processes to enhance skills and maximize operations. Reconciled DADs, TMHP, and HMO payments using MS Excel Pivot tables. Supervised and reviewed billing specialists' reconciliation. Audited client timesheets for no duplication of services, overpayments, or not exceeding weekly authorized hours with the THMP Claim Service Inquiry (CSI). Assisted Payroll Department with accounts payable, accounts receivables, and printing employees' checks with QuickBooks. Collaborated with external IT consultants on special projects.

## RESEARCH EXPERIENCE

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- May 2020-Present **Rice University** Houston, TX  
*Graduate Research Assistant*  
Working with 3 PhD colleagues on predicting benzene levels in real time around the Houston area to determine air quality. Working with PhD thesis advisor on analyzing financial time series data to predict financial crashes using topological data analysis. Writing scripts in RStudio.
- Nov 2013-May 2014 **University of Texas-Pan American** Edinburg, TX  
*Graduate Research Assistant*  
Worked on a multi-disciplined project aimed at analyzing bullet proof vests involving Dyleema and Kevlar fibers. Collaborated with chemists working in the development process of a new bullet proof vest.

## TEACHING EXPERIENCE

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- Aug 2017-May 2020 **Rice University** Houston, TX  
*Graduate Teaching Assistant*  
Assist students with homework assignments during office hours. Wrote on occasion homework assignments and solutions. Managed graders to grade assignments in timely manner.

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Jun 2014-May 2015	<b>University of Texas-Pan American</b> <i>Assistant Instructor</i> Organized and facilitated classroom lessons, exam reviews, group project guidelines, and other activities. Prepared homework sets involving Excel data sets. Graded and returned homework sets and group projects in a promptly manner with constructive feedback. Showed students how to use Excel to analyze data sets for descriptive and inferential statistics to help them with either their homework or group projects. Helped students understand homework problems. Assisted students solve problems in the web-based learning assessment and system ALEKS (Assessment and Learning in Knowledge Spaces). Collaborated with head instructor on course material, grading policies, improving communication skills. Utilize Blackboard to upload course materials, notes, and other supplementary materials to engage students with their group project or homework assignments.	Edinburg, TX
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## VOLUNTEER EXPERIENCE

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Sep 2020-Present	<b>Rice University-Freshman Math Mentorship</b> <i>Mentor</i> Mentor to 3 undergraduate mentees. Provide guidance, support, and advice on PhD programs and graduate school. Schedule group and one-to-one meetings with mentees to discuss class and exam performance.	Houston, TX
Oct 2013-Apr 2015	<b>UT-Pan American, Experimental &amp; Geometry Lab (EAGL)</b> <i>Volunteer Research Assistant/Volunteer Outreach Assistant</i> Wrote simple Mathematica code to test theoretical assumptions and hypotheses on theoretical topological research. Presented to local high schools on various mathematical subjects, such as modular arithmetic, complex numbers, and limits. Taught young children at local libraries about prime numbers in an entertaining manner.	Edinburg, TX

## EDUCATION

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Rice University Pursuing PhD in Statistics	Houston, TX May 2022
University of Texas-Pan American <b>Master of Science in Mathematical Science</b> Thesis title: "An empirical study of some branching processes with upper barrier"	Edinburg, TX August 16, 2014
University of Texas-Pan American <b>Bachelor of Science in Applied Mathematics</b>	Edinburg, TX July 9, 2014
University of Texas-Pan American <b>Graduate Certificate in Communication Training and Consulting</b>	Edinburg, TX May 14, 2011
University of Michigan-Ann Arbor <b>Bachelor of Arts in Economics, Minor in German</b>	Ann Arbor, MI August 18, 2006

## PUBLICATIONS

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Aguilar, A. and Ensor, K. (2020) Topology Data Analysis Using Mean Persistence Landscapes in Financial Crashes. *Journal of Mathematical Finance*, **10**, 648-678. doi: [10.4236/jmf.2020.104038](https://doi.org/10.4236/jmf.2020.104038).

## SKILLS

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Accounting Software: QuickBooks  
Microsoft Office: Access, Excel, Outlook, Publisher, PowerPoint, VBA, Word  
Mathematical Software: Matlab, Mathematica  
Programming Languages: C++, C#  
Statistical software: R, SPSS, SAS  
Other: Python, LaTeX, ALEKS, PowerSchool, Oracle SQL Developer, R markdown

## LANGUAGES

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English: Fluent  
Spanish: Fluent  
German: Intermediate