**Alán Dávila, Ph.D.**

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[Portfolio](http://www.alandavila.com) | [LinkedIn](https://www.linkedin.com/in/alandavila) | [GitHub](https://github.com/alandavila)

Data Scientist | Physicist

Passionate about Machine Learning, Data Visualization, Physics and its application to discover relationships in big datasets and make predictions. Interested in applying scientific training/background to leverage Machine Learning algorithms and solve hard problems with high social impact

**Skills**

Bilingual (Spanish, English), Data Analysis, Datashader, Deep Learning, Docker, Experimentation, Git, GPU DB, HoloViz, Hyper-V, LaTeX, Linux, Machine Learning, Microsoft Office, OS X, Pandas, Physics, Prototyping, scikit-learn, TensorFlow, Visual Studio, VMWare, Windows

**Programming Languages**

C/C++, C#, Mathematica, Octave/Matlab, Python, ROOT, SQL, XML

**Education**

* University of Texas at Austin | **Ph.D. in Physics** May 2013
* University of Texas at El Paso | **B.S. in Physics, s*umma cum laude*** May 2006

**Experience**

**KLA**

*Senior Software Engineer* Austin, TX July 2018 – present

* Researched and developed Machine learning solutions to predict yield from inspection and metrology data
* Contributed with DOE to apply Mask RCNN (object instance segmentation) to automate the detection of wafer signatures that reduce yield
* Developed a Python module to generate synthetic wafer signature to train DNN models (TensorFlow) with minimal or no customer data
* Evaluated GPU DB vendors’ performance for our next generation applications focusing on fast query, visualization and cross filtering of tens of billions of data points. Successfully built a prototype that demonstrated 180x speed up
* Developed a correlation dashboard to analyze hundreds of millions of metrology data points from different sources with sub-second response using Datashader for server-side rendering and Docker for fast prototyping-deployment iterations
* Trained DevOps colleagues on Python best practices

*Lead Software Quality Control Engineer* Austin, TX June 2013 – July 2018

* Designed, developed and executed manual and automated tests for the 5D/KT-Analyzer to ensure proper centralization of data from many metrology tools into Microsoft SQL and MongoDB databases, and subsequent scientific computation, inter-tool correlations and modeling
* Led a team of 5 engineers to automate legacy manual test suites using Test Complete and reduced regression testing time from 400 man-hours to just 16 hours of automated testing
* Created Python scripts and GUI’s to help the SQC team edit XML files and generate artificial testing data in bulk
* Represented the Quality Control team in all phases of software development, from marketing requirement reviews to release to manufacture. Convinced all stakeholders of the importance of integrating SQC from the earliest stages of development

**University of Texas at Austin,** Physics Department Austin, TX May 2007 - May 2013

*Research Assistant*

* Analyzed data from particles’ collisions produced at a remote accelerator/collider by using parallel computing techniques like MPI to process large amounts of data at the TACC supercomputer cluster
* Coded and debugged in C/C++ within the high energy physics data analysis framework -ROOT- to characterize nuclear collisions, extract specific signatures and signals from data-dense environments. Presented research results at international conferences
* Virtually met international research team of 10 to discuss results and foster new ideas for project development

*Teaching Assistant* Austin, TX May 2006 – May 2007

* Coached introductory mechanics and electromagnetism problem solving sessions
* Lectured introductory mechanics laboratories

**Argonne National Laboratory**, Physics Division Argonne, IL Summers 2005/2006

*Research Aide*

* Programmed computer simulations for a concept design of a small synchrotron for proton therapy
* Wrote a final progress report at the end of both summer sessions

**Publications**

* List of presentations and publications available upon request

**Certifications**

* **Data Analytics and Visualization Program** by The University of Texas at Austin July 2018
* **Scrum Product Owner** by Scrum Alliance June 2018
* **Machine Learning** by Stanford University on Coursera July 2017

**Applications Applied**

**Object Recognition Performance Dashboard**

* Back-End developer | Dashboard to determine the performance of a CNN model on user selected images both visually and quantitatively | TensorFlow, D3, Plotly | <https://orpd.herokuapp.com>

**Physics, Ph.D. Thesis**

* Main developer | Study of particle production in nuclear collisions via Jet finding algorithms in dense environments | C++, Grid Computing | <http://www.davila-nuclear.com>