Fernando Becerra

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EDUCATION

Harvard University, Department of Astronomy   *Cambridge, MA*
Ph.D. in Astronomy & Astrophysics   *May 2018 (expected)*
A.M. in Astronomy & Astrophysics   *May 2014*

Universidad de Chile, Department of Astronomy   *Santiago, Chile*
M.Sc. in Astronomy, with Highest Honors   *Aug 2012*
B.Sc. in Astronomy, with Highest Honors   *Dec 2009*

RELEVANT EXPERIENCE

Harvard University, Department of Astronomy   *Cambridge, MA*
Graduate Research Assistant   *Aug 2012 - Present*
- Lead research on formation of stars and black holes in early Universe.
- Guided, directed and managed group of 5+ collaborators to design and execute research plan.
- Implemented new modules for primordial chemistry and sink particles in C for *arepo* code.
- Developed code to generate plots, images, and videos of simulation outputs, both in Python using packages like NumPy, SciPy, and matplotlib, and in C using MPI.
- Reported findings in prestigious astronomy journals with 45+ citations.
- Presented results in 4 astronomy conferences to more than 400 attendants in total.
- Mentored and supervised 3 students, both undergraduate and graduate.

Teaching Fellow   *Spring 2013 - Spring 2014*
- Assisted in teaching 3 Harvard undergraduate courses ranging from 20 - 200 students. Topics included: general astronomy for non-science majors, and galactic and extragalactic astronomy.
- Prepared course material including laboratory experiments, exams, homework and practice problems.
- Lead weekly problem-solving and discussion sections for groups of 15-20 students.
- Assisted students using local telescopes.
- Graded exams and weekly homework.

EdX   *Cambridge, MA*
Web Developer   *Jul 2017 - Present*
- Built and developed webpage using HTML, CSS and JavaScript to host interactive module to explain randomness and normal distribution.
- Coded tabletop simulation in Three.js and created matrix plot with D3.js to visualize the results.
- Linked both elements and added interactivity to control parameters and analyze how they influence results.

Astrollytelling.io   *Cambridge, MA*
Creator   *Jul 2017 - Present*
- Crafted, designed, and sketched project to teach astronomy concepts through visual stories.
- Built, designed and developed home page using HTML, CSS, JavaScript, and Bootstrap.
- Contacted and coordinated people in different areas of astronomy to collaborate in creating and designing storytelling for interactive modules.
- Coded interactive visualizations with D3.js.

Harvard University, School of Engineering and Applied Sciences   *Cambridge, MA*
Predicting Seizures and Epilepsy Project, Data Scientist   *Oct - Dec 2016*
- Developed model to predict seizures and epilepsy based on individual's identity, medical history, social behavior, and other factors.
- Collected, manipulated, and visualized data with Python packages NumPy, pandas and matplotlib.
- Built models based on Decision Trees, Random Forests, Linear SVM, Logistic Regression, LDA and QDA using NumPy, SciPy, and scikit-learn in Python.
- Created project website using plot.ly for web interactive plots.

The Final Element Project, Web Developer   *Mar - May 2016*
- Designed interactive visualization to show properties of natural disasters around world using D3.js.
- Created interactive force layout to show human and economic costs of natural disasters in D3.js.

Pavoreal Project, Code Developer   *Oct - Dec 2013*
- Developed robust volume rendering tool to visualize simulations using Python and GPUs.
- Created routines to read 3D data, cast it to texture on GPU, interpolate it, and perform raycasting to visualize it.
- Implemented routines using Python packages like NumPy, SciPy, matplotlib, mpi4py, and pyCUDA.

Universidad de Chile, Department of Astronomy   *Santiago, Chile*
Graduate Research Assistant   *Mar 2010 - Aug 2012*
- Conducted independent research on relation between star formation and properties of galaxies.
- Modified old modules and added new ones in C and fortran to code *Enzo*.
- Developed analysis package in Python based on *yt* code to analyze simulation outputs.
- Coded analysis routines in IDL to examine simulation outputs from code *Gadget*.
- Published paper about results in *The Astrophysical Journal*.

Universidad de Chile, Department of Astronomy   *Santiago, Chile*
Undergraduate Research Assistant   *Mar 2009 - Dec 2009*
- Conducted research on distribution of energy in local galaxies.
- Performed simulations using *Enzo* code written in C and fortran.
- Modified visualization package *Jacques* using IDL and wrote routines in MATLAB to analyze results.

Las Campanas Observatory, Carnegie Institution of Washington   *La Serena, Chile*
Research Assistant   *Jan 2009*
- Conducted research on supernovae with team at Carnegie Supernova Project.
- Performed observations of supernova at *DuPont* and *Swope* telescopes.
- Analyzed observational data with the IRAF package and plotting program *supermongo*.

SKILLS

Programming	Python, C, fortran, IDL, MATLAB, JavaScript, Java, LaTeX
Web	HTML5, CSS, jQuery, D3.js, Three.js, Processing
Software	Adobe Photoshop, Adobe Illustrator, Microsoft Office Suite
Astronomy	IRAF, supermongo, ds9
Languages	English, Spanish
Other	Landscape Photography