

Alexandro Arnal

El Paso, TX
alex51195@gmail.com

RESEARCH & CAREER INTERESTS

I study computer vision methods for the analysis of brain tissue images. I value organizations who practice the scientific method in their service and offer a collaborative working environment.

EDUCATION

Ph.D., Computational Science (expected) **2021**

University of Texas at El Paso, Texas

Concentration: Computer vision techniques to model rat brain tissue

M.S., Computational Science **2020**

University of Texas at El Paso, Texas

Thesis: *Toward Automated Region Detection & Parcellation of Rat Brain Tissue Images*

Big Data Analytics Graduate Certificate **2020**

University of Texas at El Paso, Texas

B.S., Neuroscience **2015**

Baylor University, Texas

SKILLS

AV Equipment: DSLR & Mirrorless Cameras, BX53 Olympus microscope, Roland V-1HD, Blackmagic Design's Intensity Shuttle, Audio Mixers

Computer Languages: Java Script, C, C++, MATLAB, Python, R, SAS, openMP, MPI, Keras, PyTorch, Latex, HTML

Software: Flask, cellSense, FileZilla, Adobe Photoshop, Adobe Illustrator, Adobe Premiere Pro, Open Broadcaster Software, Switcher Studio, Zoom, MS Teams

Operating Systems: Unix, Linux

Human Languages: Spanish, English

EXPERIENCE

Teacher Assistant **2018 –**

University of Texas at El Paso

- Assistant to PreCalculus, Calculus 1 & 3, and Numerical Optimization
- Proctor & grade exams - grade assignments
- Meet with students to review written or code assignments

Tutor

Freelance, El Paso, TX

2018 –

- Cover topics in math, biology, chemistry, and engineering
- Tutor two high school students (now virtually)
- Improved failing grades to A's and B's.

MaRCS Tutoring Center, University of Texas at El Paso

2016 –

- Tutor Calculus 1–3, Numerical Analysis, Matrix Algebra, and Statistics.

El Paso Independent School District, El Paso, TX

2016 – 2018

- Helped clarify concepts to students during Algebra and Biology classes

Instructor

2018

UTEP Graduate School, University of Texas at El Paso

- Developed curriculum for the Analytical Writing, Verbal Reasoning and Quantitative Reasoning sections of the Graduate Record Examinations
- Gave lectures to two cohorts of about 20 students each
- Improved scores from 35 to 65 percentile on average

Clerk

2016 – 2018

Southwest NeuroSpine Institute, El Paso, TX

- Fill out referral forms and orders for diagnostic imaging
- Organize incoming radiology reports and other medical records
- Translate English to Spanish for patient convenience

Production & Communications Specialist

2009 – Present

Arnal Studio, El Paso, TX

- Manage the full production of wedding and quinceñera photo and video
- Manage equipment purchases to adapt to necessary technological advances
- Maintain the organization of all production files for future retrieval
- Design company branding and flyers and manage internet presence
- Redesigned company-to-client communication

MEMBERSHIPS

Society for Neuroscience

2019 –

Organization for Computational Neuroscience

2019 –

Computational Science Student Association

2018 –

FUNDING

College of Science Travel Grant (2021) • UTEP Graduate School Travel Grant (2019) • Dodson Research Grant (2019) • Doctoral Excellence Fellowship (2018) • Provost's Gold Scholarship (2013) • Federal Pell Grant (2013) • Supplemental Education Opportunity Grant (2013) • Tuition Equalization Grant (2013)

TRAINING

Technical Training

- How to Photograph and Edit your Artwork by Paulina Rosas (February 2021)
- Summer 2019 Workshop: Introduction to Brain Maps 4.0 rat brain atlas (Swanson, 2018); photographing with BX53 Olympus microscope; parcellation of Nissl-stained rat brain tissue.
- Focus your Creative Vision Workshop by Valerie Santagto (Summer 2013)

Seminars & Webinars

- Understanding the Basic Plan of Nervous System by Dr. Larry Swanson from *The Brain Research Institute at UCLA* via Zoom (April 2021)
- Talk With and By Dr. Osuna from *Octant* via Zoom (April 2021)
- Integrate Image Management & Image Analysis at Scale by Proscia and VisioPharm via the web (March 2021)

- Diet & Drugs: How Food Can Impact Drug Sensitivity Dr. Katherine Serafine from the *University of Texas at El Paso* during Brain Awareness Week via Zoom (March 2021)
- Talk of and by Angeline Dukes, Ph.D Candidate from the *University of California at Irvine* during Brain Awareness Week via Zoom (March 2021)
- Establishing a Rodent Model of E-cigarette Use: Current Progress and Early Findings by Dr. Ian Mendez from the *University of Texas at El Paso* during Brain Awareness Week via Zoom (March 2021)
- Flies 'R Us by Dr. Kyung-An Han from the *University of Texas at El Paso* during Brain Awareness Week via Zoom (March 2021)
- Priors for Semantic Variables by Dr. Yoshua Bengio from *Université de Montréal* via Zoom (July 2020)
- Graph Nets: The Next Generation by Dr. Max Welling from the *University of Amsterdam* via Zoom (July 2020)
- Attractors, Memory, and Oscillations: Computational Motifs of Spatial Learning by Dr. Joseph Monaco from *Johns Hopkins University School of Medicine* at the University of Texas at El Paso (Jan 2020)
- Two- Three-photon Imaging by Dr. Arani Roy from the *Department of Neuroscience, University of Minnesota* at the University of Texas at El Paso (Jan 2020)
- Immune Responses of the Nervous System by Dr. Valentin A. Pavlov from *Center for Biomedical Science and Bioelectronic Medicine Feinstein Institutes for Medical Research* at Texas Tech El Paso (Nov 2019)
- Automatic segmentation of Lung Nodules Evident in CT Scans by Dr. Chunqiang Li and the Bioinformatics department at the University of Texas at El Paso (Oct 2019)
- Advances in Optogenetics Due to Holography by Dr. Valentina Emiliani from *Institut de la Vision* at The Society of Neuroscience – Neuroscience 2019 (Oct 2019)
- Spinal Surgery Seminar by Dr. George J Martin from *Southwest NeuroSpine Institute* at Las Cruces, NM. (Nov 2016)

Professional Development

- Professionalism 101 by the Graduate School at the University of Texas at El Paso (Oct 2019)

WRITING

Published

- Arnal A, (2020). Toward Automated Region Detection & Parcellation of Rat Brain Tissue Images. *Open Access Theses Dissertations*. 3081. https://scholarworks.utep.edu/open_etd/3081

Unpublished

- Arnal A, Fuentes O (2021). Effects of resolution and scale on segmentation of Nissl-stained rat brain tissue images via convolutional neural networks

Abstract Presentations

- Arnal A, Fuentes O, Khan AM. (2019). Computer vision-based tools to segment gray and white matter regions in experimental tissue sections and to analyze tracer injection sites mapped in digital atlas space: Use cases for the hypothalamus and ventral tegmental area for circuits related to feeding control. Program

No. 149.22. 2019 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2019. Online.

- Arnal A, Fuentes O, Khan AM. (2020). Effects of resolution and scale on segmentation of Nissl-stained rat brain tissue images via convolutional neural networks. Abstract submitted to the Society for Neuroscience.
- Arnal A (2019). Cytoarchitectural regionalization of experimental brain tissue sections. Abstract submitted to The University of Texas at El Paso Graduate School Graduate Student Expo 2019

Reviewer

- Jimenez MG (2021) EMOCOLOR : Fine-Grained Emotion Recognition from Skin Color Information *unpublished*
- Aryal B (2020) Glacier Segmentation In Satellite Images For Hindu Kush Himalaya Region *Open Access Theses & Dissertations*. 3140. https://scholarworks.utep.edu/open_etd/3140
- Dey S (2020) Predicting Solar X-ray Flux Using Deep Learning Techniques *unpublished*
- Huang D, Grady F, Peltekian L, Laing J, Geerling J (2020) Efferent Projections of CGRP/Calca-expressing Parabrachial Neurons in Mice. *Journal of Comparative Neurology*. Manuscript ID: JCN-20-0200.R1

COMMUNITY SERVICE

Society for Neuroscience Sun City Chapter

2020 –

- Manage chapter's website and social media platforms. <https://bit.ly/30DBzOD>
- Increased online engagement by > 500% and reached more than 2.2K users.
- Organized *Resilient Perceiver, an art show* with a team of 4 as part of Brain Awareness Week 2021

Guest Speaker at AI4All

2020

- Engaged a group of high school students
- Drew similarities between biological & computer vision
- Presented results of my research on parcellation of rat brain tissue images
- Emphasized the awareness of human bias when interpreting data and results

Creative Kids Volunteer

2016

- Posted and sold old equipment on craigslist
- Assisted children working on art projects/concepts
- Helped set up venues for public events and galleries

Communications Ministry Member

2013 –

- Implemented streaming capabilities to address regulations during pandemic, reaching an audience of more than 15K individuals.
- Trained a group of 10 members on the streaming technology, documented procedures, and created schedules.
- Recorded Sunday mass for ill members of the church who were unable to attend