Alexandro Arnal

El Paso, TX
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RESEARCH & CAREER

My current research involves computer vision methods for the analysis of brain tissue images. I seek employment with an organization that offers a dynamic and collaborative work environment.

EDUCATION

Ph.D., Computational Science **(expected) 2021**
University of Texas at El Paso, Texas
Concentration: *Computer Vision & Deep Learning*

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

EXPERIENCE

Teacher Assistant **2018 –**
University of Texas at El Paso
- Assistant to PreCalculus, Calculus 1 & 3, Numerical Optimization, and Intro to Statistics
- 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 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 40 to 60 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 production of photo and video for events like weddings and quinceañeras.
- Maintain the organization of all production files for future retrieval
- Develop company branding and manage internet presence
- Secured more sales by redesigning company-to-client communication.
- Manage equipment purchases

SKILLS

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

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

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

Operating Systems: Unix, Linux

Human Languages: Spanish, English

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
- Computer Vision for Microscopy Image Analysis via Zoom (June 2021)
- Gradients of Brain Organization Workshop via Zoom (June 2021)
- 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-cigaratte 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)
- Gradients of Brain Organization Workshop via Zoom (June 2020)
- 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

Poster Presentations

- 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, 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 (2019). Cytoarchitectural regionalization of experimental brain tissue sections. Abstract submited to The University of Texas at El Paso Graduate School Graduate Student Expo 2019.

Oral Presentations

- Arnal A, Fuentes O, Khan AM. (2021). Effects of resolution and scale on segmentation of Nissl–stained rat brain tissue images via convolutional neural networks. Presented as *work-in-progress* during the Computer Vision for Microscopy Image Analysis workshop

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

Computational Science Student Association **2021 –**

- Current Public Relations officer
- Developing communication channels for future, current, and past students of the Computational Science Program

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