

# Alexandro Arnal

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latente.io

RESEARCH & CAREER	My current research involves computer vision methods for the analysis of brain tissue images. I seek a full-time opportunity where I can use my expertise in Computer Vision, Data Science, Deep Learning, and Neuroscience.
EDUCATION	<div><div><b><i>Ph.D., Computational Science</i></b> University of Texas at El Paso, Texas Concentration: <i>Computer Vision &amp; Deep Learning</i></div><div>(expected) 2022</div></div> <div><div><b><i>M.S., Computational Science</i></b> University of Texas at El Paso, Texas Thesis: <i>Toward Automated Region Detection &amp; Parcellation of Rat Brain Tissue Images</i></div><div>2020</div></div> <div><div><b><i>Big Data Analytics Graduate Certificate</i></b> University of Texas at El Paso, Texas</div><div>2020</div></div> <div><div><b><i>B.S., Neuroscience</i></b> Baylor University, Texas</div><div>2015</div></div>
EXPERIENCE	<div><div><b><i>Reseracher</i></b> Vision &amp; Learning Lab at The University of Texas at El Paso<ul style="list-style-type: none"><li>• Develop computer programs to process and learn images of rat brain tissue stained for Nissl</li><li>• Organize lab meetings</li></ul></div><div>2018 –</div></div> <div><div>UTEP Systems Neuroscience Laboratory at The University of Texas at El Paso<ul style="list-style-type: none"><li>• Develop data visualization methods for standardized brain atlases</li></ul></div></div> <div><div><b><i>Teacher Assistant</i></b> University of Texas at El Paso<ul style="list-style-type: none"><li>• Assistant to PreCalculus, Calculus 1 &amp; 3, Numerical Optimization, and Intro to Statistics</li><li>• Proctor &amp; grade exams - grade assignments</li><li>• Meet with students to review written or code assignments</li></ul></div><div>2018 –</div></div> <div><div><b><i>Tutor</i></b> Freelance, El Paso, TX<ul style="list-style-type: none"><li>• Cover topics in math, biology, chemistry, and engineering</li><li>• Tutor two high school students (now virtually)</li><li>• Improved grades by 10 to 30 percent.</li></ul></div><div>2018 –</div></div> <div><div>MaRCS Tutoring Center, University of Texas at El Paso<ul style="list-style-type: none"><li>• Tutor Calculus 1–3, Numerical Analysis, Matrix Algebra, and Statistics.</li></ul></div><div>2016 –</div></div>

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-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)
- 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](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 submitted 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](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 the 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