ADRIAN CELAYA

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EDUCATION

Rice University **2026 (expected)**
Ph.D. Computational and Applied Mathematics Houston, TX
Advisors: Beatrice Riviere and David Fuentes

Rice University **2023 (expected)**
M.A. Computational and Applied Mathematics Houston, TX
Advisors: Beatrice Riviere and David Fuentes
Thesis: PocketNet: A Smaller Neural Network for Medical Image Analysis

Rice University **May 2016**
B.A. Computational and Applied Mathematics Houston, TX
Overall GPA: 3.70/4.00

PROFESSIONAL EXPERIENCE

Research Intern **May. 2022 - Aug. 2022**
TotalEnergies, Advisor: Mauricio Araya-Polo Houston, TX

- Developed novel, state-of-the-art deep learning methods for the inversion of surface gravity data for CO_2 sequestration monitoring

Research Assistant **Sept. 2020 - July 2021**
MD Anderson Cancer Center, Advisor: David Fuentes Houston, TX

- Developed novel, computationally efficient deep learning architectures for 3D medical image segmentation and classification
- Created Docker images for containerizing complex neuroimaging analysis pipelines, allowing the work of previous researchers to be easily integrated into ongoing and future projects
- Mentored two summer students through the Cancer Prevention & Research Institute of Texas (CPRIT)-CURE Summer Undergraduate Program

Information System Security Manager **Aug. 2016 - Aug. 2020**
U.S. Navy, USS Carl Vinson San Diego, CA

- Led a team of 9 highly talented cybersecurity analysts who oversaw the security and integrity of a $20,000,000 computer network consisting of roughly 4,000 assets with zero intrusions or major incidents
- Implemented a comprehensive network security program that resulted in the organization′s highest ever cybersecurity score when evaluated by external security auditors
- Received extensive training on computer and communication networks, cryptographic key management, and computer network defense

GRANTS AND FELLOWSHIPS

National Defense Science and Engineering Fellowship **Sep. 2022 - May 2025**
Department of Defense Houston, TX

Loewenstern Fellowship **Aug. 2021 - Oct. 2022**
Rice University Houston, TX

PEER-REVIEWED PUBLICATIONS

1. **A. Celaya**, A. Diaz, A. Balsells, B. Riviere, and D. Fuentes. "A Weighted Normalized Boundary Loss for Reducing the Hausdorff Distance in Medical Imaging Segmentation," submitted to *26th International Conference on Medical Image Computing and Computer Assisted Intervention*, under review, 2023.

2. **A. Celaya**, B. Denel, Y. Sun, M. Araya-Polo, and A. Price. "Inversion of Time-Lapse Surface Gravity Data for Detection of 3D CO_2 Plumes via Deep Learning," submitted to *IEEE Transactions on Geosciences and Remote Sensing*, under review, 2022.

3. R. Muthusivarajan, **A. Celaya**, J. Yung, S. Viswanath, D. Marcus, C. Chung, and D. Fuentes. "Evaluating the relationship between magnetic resonance image quality metrics and deep learning-based segmentation accuracy of brain tumors," submitted to *Medical Physics*, under review, 2022.

4. **A. Celaya** , J. A. Actor, R. Muthusivarajan, E. Gates, C. Chung, D. Schellingerhout, B. Riviere, and D. Fuentes. "PocketNet: A Smaller Neural Network For Medical Image Analysis," in *IEEE Transactions on Medical Imaging*, doi: 10.1109/TMI.2022.3224873.

5. E. Gates, D. Suki, **A. Celaya**, J. Weinberg, S. Prabhu, R. Sawaya, J. Huse, J. Long, D. Fuentes, and D. Schellingerhout. "Cellular Density in Adult Glioma, Estimated with MR Imaging Data and a Machine Learning Algorithm, Has Prognostic Power Approaching World Health Organization Histologic Grading in a Cohort of 1181 Patients," in *American Journal of Neuroradiology*, doi: 10.3174/ajnr.A7620.

6. E. Gates, **A. Celaya**, D. Suki, D. Schellingerhout, and D. Fuentes. "Technical Note: An efficient MR image data quality screening dashboard," in *Journal of Applied Clinical Medical Physics*, doi: 10.1002/acm2.13557.

CONFERENCE PRESENTATIONS

1. **A. Celaya** "Inversion of Time-Lapse Surface Gravity Data for Detection of 3D CO_2 Plumes via Deep Learning," in *16th Annual Energy High Performance Computing Conference.* Technical Talk. Houston, TX. February 2023.

2. **A. Celaya** . "PocketNet: A Smaller Neural Network For Medical Image Analysis," in *5th Annual SIAM Texas-Louisiana Section Meeting.* Invited Minisymposium Presentation. Houston, TX. November 2022.

3. **A. Celaya**. "Small Convolutional Neural Networks for Efficient 3D Medical Image Segmentation," in *63rd American Association of Physicists in Medicine Annual Meeting.* Virtual. July 2021.

CONFERENCE POSTERS

1. A. Balsells, B. Riviere, D. Fuentes, and **A. Celaya**. "Interactive Brain Tumor Image Segmentation," in *5th Annual SIAM Texas-Louisiana Section Meeting*, Houston, TX. October 2022.

2. A. Balsells, B. Riviere, D. Fuentes, and **A. Celaya**. "Interactive Brain Tumor Image Segmentation," in *32nd Keck Annual Research Conference*, Houston, TX. October 2022.

3. R. Muthusivarajan, **A. Celaya**, J. Yung, S. Viswanath, D. Marcus, C. Chung, and D. Fuentes. "Evaluating the relationship between magnetic resonance image quality metrics and deep learning-based segmentation accuracy of brain tumors," in *64th American Association of Physicists in Medicine Annual Meeting*. Washington, DC. July 2022.

4. E. Gates, **A. Celaya**, D. Schellingerhout, and D. Fuentes. "Automated Cerebrospinal Fluid ROI Selection on Brain Magnetic Resonance Images," in *30th Keck Annual Research Conference*. Virtual. October 2020.

HONORS AND AWARDS

Navy Marine Corps Commendation Medal **Aug. 2020**
U.S. Navy San Diego, CA

President's Honor Roll **May 2016**
Rice University Houston, TX

SKILLS

Languages Spoken: English (native), Spanish (conversant)
Programming Languages and Software: Python, Matlab, C/C++, TensorFlow, Keras, PyTorch, Docker, LaTeX

Last updated: February 2023