# ADRIAN CELAYA

+1 (956) 346-6109 | aecelaya@rice.edu | https://aecelaya.github.io

## EDUCATION

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

**Rice University** **May 2023**
M.A. Computational and Applied Mathematics Houston, TX
Advisors: Beatrice Riviere and David Fuentes
Thesis: *PocketNet: A Smaller Neural Network for Medical Image Analysis*
Overall GPA: 3.91/4.00

**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 & FELLOWSHIPS

**National Defense Science & 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**, B. Riviere, and D. Fuentes. "FMG-Net and W-Net: Multigrid Inspired Deep Learning Architectures For Medical Imaging Segmentation," submitted to *37th Conference on Neural Information Processing Systems*, under review, 2023.

2. **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.

3. **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," in *IEEE Transactions on Geosciences and Remote Sensing*, doi: 10.1109/TGRS.2023.3273149.

4. 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.

5. **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.

6. 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.

7. 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.

## PROFESSIONAL SERVICE & ACTIVITIES

Reviewing: *Medical Physics*, *IEEE Transactions on Geoscience and Remote Sensing*

## HONORS & 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: April 2023