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# Theodore J. LaGrow, PhD, MBA

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## EDUCATION

**GEORGIA INSTITUTE OF TECHNOLOGY** | Atlanta, GA

**Ph.D. in Electrical and Computer Engineering** | *April 2025*

- **Dissertation:** *Exploration of Spatiotemporal Dynamics in Neurodegenerative Functional Brain Networks*
- **Advisors:** Dr. Shella Keilholz (Biomedical Engineering), Dr. Jeff Davis (ECE)
- **Minor:** Biomedical Engineering
- **Committee:** Drs. Vince Calhoun, Sergey Plis, Matthieu Bloch, Eric Schumacher.

**Master of Business Administration (MBA)** | *May 2022*

- Scheller College of Business; Concentrations: Technology Consulting, Data Analytics.

**Associate in Higher Education Pedagogy** | *May 2021*

- Center for Teaching and Learning (CETL)

**M.S. in Electrical and Computer Engineering** | *May 2019*

- Concentrations: Computer Vision, Signal Processing, Theoretical Machine Learning.

**UNIVERSITY OF OREGON** | Eugene, OR

**B.S. Computer and Information Science** (Departmental Honors) | *June 2017*

**B.S. Mathematics** | *June 2017*

- *Minors:* Physics and Theater Arts.

## RESEARCH INTERESTS

- **Neuroimaging:** Spatiotemporal dynamics, large-scale functional networks (rs-fMRI), and neurodegenerative biomarkers for Alzheimer's Disease.
- **Applied AI:** Deep reinforcement learning, signal processing, and computer vision in clinical diagnostics.
- **Pedagogical Engineering:** Scalable online education, LLM-based instructional workflows, and professional engineering education.

# ACADEMIC APPOINTMENTS

**GEORGIA INSTITUTE OF TECHNOLOGY** | Atlanta, GA

**Lecturer & Instructor**, Georgia Tech Professional Education (GTPE) | *Aug 2025 – Present*

- *College of Lifetime Learning, FlexStack Program*
- Lead end-to-end design and delivery of professional certificate coursework in Python data analytics, visualization, and applied machine learning.
- Appointed to the **Professional Education Curriculum Committee** (Nov 2025).

**GEORGIA INSTITUTE OF TECHNOLOGY** | Atlanta, GA

**Instructor of Record (IoR)**, College of Computing / ECE | *2020 – Present*

- **CS 7641: Machine Learning (OMSCS):** Managing delivery for 1,400+ graduate students per term (*Spring 2023 – Present*).
- **CS 7642: Reinforcement Learning (OMSCS):** Led graduate-level instruction (*Fall 2023*).
- **CETL 8000: GTA Preparation:** Lead instructor for graduate teaching assistant training (*Fall 2020 – Spring 2022*).

# TEACHING EXPERIENCE

## Primary Instructional Roles (Georgia Tech)

**Instructor of Record (IoR) | OMSCS CS 7641: Machine Learning** | *Spring 2023 – Present*

- Lead instruction for one of the largest graduate-level machine learning courses globally (1,400+ students per term).
- Direct a staff of 30+ Graduate Teaching Assistants, overseeing grading operations, student-support logistics, and TA mentoring.
- Spearhead continuous curriculum updates and maintain a public course blog for instructional transparency.

**Lecturer & Instructor | GTPE FlexStack Certificate Program** | *Aug 2025 – Present*

- **Python Data Modeling and Visualization Certificate:** Designed and delivered three core courses: *Decision-Ready Data*, *Plot with Purpose*, and *Modeling and Machine Learning*.
- **Python AI Principles Certificate:** Developing modules on *LLMs*, *Applied Generative AI*, and *Agentic AI Development*.
- Deliver six hours of live, synchronous online instruction per week, bridging theoretical concepts with industry-standard labs.

**Instructor of Record | OMSCS CS 7642: Reinforcement Learning** | *Fall 2023*

- Managed all instructional operations, including content delivery, assignment assessment, and exam design for a large-scale online graduate cohort.

**Instructor of Record | CETL 8000: GTA Preparation** | *Fall 2020 – Spring 2022*

- Facilitated pedagogical training for incoming Graduate Teaching Assistants, focusing on learner-centered teaching, assessment design, and inclusive classroom management.

## Graduate Teaching Assistance & Mentorship (Georgia Tech)

**Teaching Assistant | OMSCS CS 7642: Reinforcement Learning** | *Spring 2020 – Summer 2023*

- *Instructors:* Dr. Charles Isbell (isbell@gatech.edu) and Dr. Michael Littman (mlittman@cs.brown.edu).

**Head TA | ECE 6254: Statistical Machine Learning** | *Spring 2020*

- Awarded the ECE Departmental Outstanding Graduate Teaching Assistant Award.
- *Instructor:* Dr. Matthieu Bloch (matthieu.bloch@gatech.edu).

**Head TA | ECE 4122/6122: Advanced Programming Techniques** | *Fall 2019*

- Managed a team of 9 TAs and grading operations for 300 students. Nominated for Dept. Outstanding GTA Award.
- *Instructor:* Dr. Jeffery Hurley (jeffery.hurley@gtri.gatech.edu).

**Head TA | CS 4400: Introduction to Databases & CS 2340: Objects and Design** | *Summer 2019*

- Led course development and exam operations. Delivered guest lectures on storage systems and indexing.
- *Instructor:* Dr. Aibek Musaev (aibek.musaev@gatech.edu).

**Peer Assistant TA | Berlin Study Abroad Program (CS 4400 & CS 2340)** | *Summer 2022*

- Supported immersive instruction and student success in a compressed, international format.
- *Instructor:* Dr. Mark Moss (mmoss7@gatech.edu).

**Grand Challenge Facilitator | Georgia Tech LEAD** | *Aug 2017 – Present*

- Mentor interdisciplinary student teams on innovation projects, coaching them through problem-solving and collaboration frameworks.
- *Contacts:* Dr. Wes Wynens (wes.wynens@gatech.edu), Dr. Jeff Davis (jeff.davis@ece.gatech.edu).

# ACADEMIC GRANTS & FELLOWSHIPS

## Research Funding

- **Trainee Researcher (R24MH114799):** "SABER: Scalable Analytics for Brain Exploration Research." National Institute of Mental Health (NIMH); (*2017–2019*).
- **Research Support Grant:** Presidential Undergraduate Research Scholarship (UO); $10,000 (*2016–2017*).
- **NSF REU Fellow (1550202):** High-performance computing lab, University of Oregon; (*2016*).

## Institutional Fellowships

- **Grand Challenges Leadership Fellow (LEAD):** $30,000 total award over 5 years (*2017–2022*).
- **Graduate Teaching Fellowship (CETL):** Instructional development grant; $16,000 total (*2021–2023*).
- **TI:GER Program Fellow:** Technology Innovation: Generating Economic Results (*2020–2022*).
- **George F. Riley Fellow:** Departmental nomination for work/leadership, School of ECE; $4,000 (*2020*).
- **Graduate Research Assistantship:** Wallace H. Coulter Dept of BME (*2017–2019*).

# PUBLICATIONS

## Peer-Reviewed Journal Articles

1. Xu, N., Yousefi, B., Anumba, N., **LaGrow, T. J.**, Zhang, X., & Keilholz, S. (2025). QPPLab: A Software Package for Detecting, Analyzing, and Visualizing Large-Scale Quasiperiodic Spatiotemporal Patterns. *SoftwareX*, 29, 102067.
2. Itkyal, V. S., Iraji, A., Jensen, K. M., **LaGrow, T. J.**, Duda, M., Turner, J. A., ... & Wu, L. (2025). Evidence for white matter intrinsic connectivity networks at rest and during a task: a large-scale study and templates. *Network Neuroscience*, 9(4), 1221-1244.
3. Watters, H., Davis, A., Fazili, A., Daley, L., **LaGrow, T. J.**, & Schumacher, E. H. (2025). Infraslow dynamic patterns in human cortical networks track a spectrum of external to internal attention. *Human Brain Mapping*, 46(3), e70049.
4. Anumba, N., Kelberman, M. A., Pan, W., Marriott, A., Zhang, X., Xu, N., Weinshenker, D., & **LaGrow, T. J.**, & Keilholz, S. (2024). The effects of locus coeruleus optogenetic stimulation on global spatiotemporal patterns in rats. *Imaging Neuroscience*, 2, 1-21.
5. Meyer-Baese, L., ... **LaGrow, T. J.**, ... & Keilholz, S. (2024). Distribution of Large-scale Spatiotemporal Patterns Across Brain States. *Frontiers in Systems Neuroscience*.
6. Anumba, N., Maltbie, E., Pan, W., **LaGrow, T. J.**, Xu, N., & Keilholz, S. (2023). BOLD Global Signal in rat resting-state functional MRI. *Magnetic Resonance in Medicine*.

7. Xu, N., **LaGrow, T. J.**, ... & Keilholz, S. (2022). Functional Connectivity of the Brain Across Rodents and Humans. *Frontiers in Neuroscience*.
8. Keilholz, S., ... **LaGrow, T. J.**, & Guo, Y. (2020). Relationship Between BOLD Fluctuations and Metrics of Complexity. *Frontiers in Neuroscience*.
9. Johnson, E. C., ... **LaGrow, T. J.**, ... & Gray-Roncal, W. (2020). Scalable Framework for Reproducible Processing of Volumetric, Nanoscale Neuroimaging Datasets. *GigaScience*.
10. **LaGrow, T. J.**, Bieker, J., & Norris, B. (2017). Exploration of Scientific Literature Using NLP. *Oregon Undergraduate Research Journal*.

## Refereed Conference Papers

1. **LaGrow, T. J.**, Itkyal, V. S., Watters, H., Jensen, K. M., Ballem, R., Pan, W., ... & Keilholz, S. (2025). Widespread Spatiotemporal Patterns of Functional Brain Networks in Longitudinal Progression of Alzheimer's Disease. *2025 47th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 1-7. doi: 10.1109/EMBC58623.2025.11251603. PMID: 41336827.
2. Itkyal, V. S., Abrol, A., **LaGrow, T. J.**, & Calhoun, V. D. (2025). Investigating White Matter Functional Network Connectivity Across the Alzheimer’s Disease Spectrum Using Resting-State fMRI. *2025 47th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 1-6.
3. Itkyal, V. S., Abrol, A., **LaGrow, T. J.**, & Calhoun, V. D. (2023). Voxel-wise Data Fusion of Resting fMRI Networks and Gray Matter Volume via Deep Learning for Alzheimer’s Disease Classification. *2023 IEEE International Symposium on Biomedical Imaging (ISBI)*, 1-5.
4. **LaGrow, T. J.**, Moore, M. G., Prasad, J. A., Davenport, M. A., & Dyer, E. L. (2018). Approximating Cellular Densities from High-Resolution Neuroanatomical Imaging Data. *2018 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 1-4.

## Preprints & Manuscripts Under Review

1. **LaGrow, T. J.**, Watters, H., Daley, L., Itkyal, V., Seeburger, D., Anumba, N., Fazili, A., Kelberman, M. A., Calhoun, V., & Pan, W-J. (2026). Fidelity of Spatiotemporal Patterns of Brain Activity Across Sampling Rate, Scan Duration, and Frequency Content. *bioRxiv* 2026.01.02.697199. [Under Review at *Imaging Neuroscience*]
2. Itkyal, V. S., **LaGrow, T. J.**, Jensen, K. M., Iraji, A., & Calhoun, V. D. (2026). Investigating White Matter Functional Network Connectivity Across the Alzheimer's Disease Spectrum Using Resting-State fMRI. *bioRxiv* 2026.02.04.703913. [Under Review at *Frontiers in Neuroimaging*]
3. **LaGrow, T. J.**, Itkyal, V., Watters, H., Jensen, K. M., Ballem, R., Pan, W., ... & Keilholz, S. (2025). Spatiotemporal Network Dynamics Reveal Alzheimer's Disease Progression. *bioRxiv* 2025.12.09.692653. [Under Review at *IEEE Transactions on Biomedical Engineering (TBME)* — Special Issue: Top Papers of EMBC 2025]

4. Watters, H., Fazili, A., Daley, L., Belden, A., **LaGrow, T. J.**, Bolt, T., & Loui, P. (2024). Creative tempo: Spatiotemporal dynamics of the default mode network in improvisational musicians. *bioRxiv*.
5. **LaGrow, T. J.**, Moore, M. G., Prasad, J. A., Webber, A., Davenport, M. A., & Dyer, E. L. (2018). Sparse Recovery Methods for Cell Detection and Layer Estimation. *bioRxiv*, 445742.

# CONFERENCE PRESENTATIONS & EXPERIENCES

- **EMBC 2025 (Copenhagen, Denmark):** *Widespread Spatiotemporal Patterns of Functional Brain Networks in Longitudinal Progression of Alzheimer's Disease*. (Podium Presentation; Selected for Top Paper Special Issue).
- **OHBM 2025 (Brisbane, Australia):** *Projection of Spatiotemporal Patterns of Functional Brain Networks in Alzheimer's Disease*. (First Author, Poster).
- **OHBM 2024 (Seoul, Korea):** *Intrinsic Phase-Coupled Variations of Global Signal in Human Resting State Functional Connectivity*. (First Author, Poster).
- **OHBM 2024 (Seoul, Korea):** *Visually demanding task show altered sensory network dynamics compared to congruence tasks*. (Co-author).
- **OHBM 2024 (Seoul, Korea):** *Independent VIP: Unveiling Spatial Patterns in Resting-State Functional MRI Networks*. (Co-author).
- **OHBM 2024 (Seoul, Korea):** *Characterizing Dynamic Brain States in Subjects Across States of Wakefulness*. (Co-author).
- **OHBM 2023 (Montreal, Canada):** *Distribution of Large-Scale Spatiotemporal Patterns Within and Across Individuals*. (Co-author).
- **OHBM 2023 (Montreal, Canada):** *Toward Mapping the Assumed Neuronal Excitability State with fMRI Correlations*. (Co-author).
- **ISBI 2023 (Cartagena, Colombia):** *Voxel-wise Data Fusion of Resting fMRI Networks via Deep Learning for Alzheimer's Disease Classification*. (Co-author).
- **EMBC 2018 (Honolulu, HI):** *Approximating Cellular Densities from High-Resolution Neuroanatomical Imaging Data*. (Podium Presentation).
- **NYU/MLB Media Lab Hackathon 2017:** Team Leader, First Place for Data Visualization.
- **Oregon Undergraduate Symposium 2017:** Poster Presentation on NLP Analysis of Scientific Literature.

# INNOVATION & ENTREPRENEURSHIP

## Patents

- Enten, A. C., & **LaGrow, T. J.** (2025). *Capturing diagnosable video content using a client device*. U.S. Patent No. 12,419,516.

## Startup Leadership: Insight Optics

**Co-Founder & Director of Research and Development** | *May 2018 – Mar 2024*

- Directed a global team of eight engineers across the USA, Canada, Romania, and Spain to develop scalable solutions for low-resolution medical image stitching and novel panorama algorithms.
- Spearheaded a successful $200,000 non-dilutive grant application with United Way Metropolitan Dallas Area, integrating proprietary technology into a large health network while enhancing prognosis of diabetic retinopathy across five states (TX, LA, GA, TN, AL).
- Managed the technical transition from incubator phase (Create-X) through venture-backed scaling, leveraging AWS to ensure FDA, HIPAA, and ISO compliance for data management.
- Curated and maintained datasets exceeding 100K videos and millions of images to build proprietary machine learning models optimized for medical diagnostics and neuro-ophthalmology.
- Won prestigious pitch competitions and secured over $2.25MM in total capital, successfully translating technical innovations into scalable healthcare solutions.

## Venture Funding & Non-Dilutive Awards

- **Venture Capital (Seed):** Secured $1.5M for Insight Optics, Inc. (*2018–2023*).
- **United Way HITC Venture Award:** Winner; $200,000 prize funding (*2021*).
- **Create-X Startup Summer Accelerator:** Winner; $15,000 cash prize (*2019*).
- **Health Wildcatters Pitch Competition:** Winner; $14,000 cash and in-kind services (*2018*).
- **TiE University Global Pitch Competition:** 3rd Place Finish; $9,000 total award (*2021*).
- **TiE University Atlanta Chapter Finals:** Winner; $5,000 cash prize (*2021*).

## Leadership & Founding Initiatives

**Lead Creator & Principal Organizer | QuackCon Sports-Technology Hackathon** | *2016 – 2017*

- Founded the first collegiate-sanctioned sports hackathon in the U.S. at the University of Oregon; raised **$60,000** in sponsorship (Nike, Intel, IDEO).

# TECHNICAL SKILLS

- **Computational & Statistical:** Python (PyTorch, Scikit-learn, Pandas), R (tidyverse, ggplot2), JavaScript/TypeScript (Node.js, React), Java, C/C++, Scala, MATLAB, SQL, HTML5/CSS3.
- **Neuroimaging:** FSL, AFNI, ANTs, Nilearn, MRI sequence analysis.
- **Cloud & DevOps:** AWS (EC2, S3, HIPAA-compliant storage), Docker, Git.
- **Instructional:** Canvas LMS, Ed Discussion, Scalable Autograding Workflows.

# HONORS & AWARDS

- **Institutional Winner – Online TA of the Year**, Georgia Tech (*2023*).
- **Outstanding Graduate Teaching Assistant Award**, College of Computing/ECE (*2020, 2021, 2023*).
- **NSF GRFP Honorable Mention** (*2019*).
- **Presidential Undergraduate Research Scholarship (PURS)**, University of Oregon (*2016–2017*).
- **Outstanding Technical Prize & Overall Best Project**, UO CIS 441 (Ray Tracing Spheres) (*2016*).
- **Presidential Scholarship (Full Tuition Merit-Based)**, University of Oregon (*2013–2017*).
- **Irene Ryan Nomination**, Kennedy Center American College Theater Festival (*2014*).
- **OSAA State Winner**, Classical Bass Singing (*2013*).
- **International Honor Thespian** (*2013*).
- **Intel Scholarship Recipient** (*2013*).
- **Eagle Scout** (*2008*).

# PROFESSIONAL SERVICE

- **Committee Member:** GTPE Professional Education Curriculum Committee (*2025 – Present*).
- **Ad-hoc Reviewer:** Organization for Human Brain Mapping (OHBM).
- **Grand Challenge Facilitator:** Georgia Tech Office of Leadership Development (*2017 – Present*).