

Rodney LaLonde

AI Researcher, Educator, & Mentor

 Vienna, VA (Relocating to TN) |  586 242 0077 |  lalonderodney@gmail.com |  linkedin.com/in/rodneylalde

 rodneylalde.wixsite.com/personal

 scholar.google.com/citations?&ft4pC1AAAAAJ

ACADEMIC PROFILE

An industry leader in Artificial Intelligence who is passionate about novel ideas and discoveries. Experienced research scientist, manager, and teacher, specialized in computer vision & machine learning methods for Explainable AI (XAI), Large Language Models (LLMs) & Vision-Language Models (VLMs), Few-Shot & Zero-Shot Learning, Object Detection & Segmentation in medical image analysis, national defense, and autonomous driving applications.

EDUCATION

University of Central Florida - 2016 – 2020

- **Ph.D.** in Computer Science
 - Specialization: Computer Vision
 - Research conducted at the **Center for Research in Computer Vision (CRCV)**
 - Adviser: Dr. Ulaş Bağcı
 - Recipient of the UCF Office of Research & Commercialization Doctoral Fellowship
- **M.S.** in Computer Science, 2019

St. Olaf College - 2012 – 2016

- **Bachelor of Arts, Triple Major** in Computer Science, Physics, & Mathematics
 - Graduated with Distinction in Computer Science (one of two students in the graduating class)
 - Recipient of the Computer Science Research Excellence Award, Class of 2016

RESEARCH INTERESTS

Primary Fields:

- Computer Vision, Machine Learning

Methodological Focus:

- Explainable AI (XAI), Large Language Models (LLMs) & Vision-Language Models (VLMs), Few-Shot & Zero-Shot Learning, Object Detection & Segmentation

Application Interests:

- AI for Medical Imaging (early cancer detection & diagnosis), AI for the Digital Humanities, Foundations of Machine Learning & Algorithmic Elegance

PROFESSIONAL EXPERIENCE

2022 – *Present* - Machine Learning Researcher - Palantir Technologies Inc.

- Led machine learning efforts for a DoD Program of Record among others, delivering multiple mission-critical AI models that directly generated significant revenue and secured a **\$100M contract vehicle**.
- Pioneered the company's "Visual Search" capability and coined the "**Large Vision Model (LVM)**" concept to evangelize novel AI workflows, successfully transforming a research prototype into a core, revenue-generating technology offering.
- Led foundational R&D across multiple AI domains, improving **Large Language Model (LLM)** entity extraction accuracy from 36% to over 80% and developing **Vision-Language Models** to achieve competitive parity with industry rivals in under a week.

2020 – 2022 - Senior Computer Vision Researcher - Kitware, Inc.

- Led a research team on a zero-shot object detection project for the **National Geospatial-Intelligence Agency (NGA)**; developed and delivered a novel framework that achieved near 95% accuracy on rare object classes.
- Provided key research guidance for a Person Search project that achieved state-of-the-art results, culminating in a peer-reviewed **publication at a top-tier conference, CVPR 2022**.
- Developed a novel framework for the **Air Force Research Laboratory (AFRL)** to automatically quantify dataset quality, using embedding similarity to measure key factors like near-duplicate content and intra-class variation.

2019 - Machine Learning Intern - Aptiv (formerly nuTonomy)

- Collaborated directly with the Director of Machine Learning to design and implement a novel real-time instance segmentation framework, improving the perception capabilities of their **autonomous driving** system.
- Gained direct experience with the full perception-to-control pipeline for autonomous vehicles in a production-focused R&D environment.

2017 – 2018 - Sr. Technical Specialist, Special Projects Group, Advanced Research Division - Lockheed Martin

- Led the research and development of a novel deep learning framework for small object detection; subsequently assisted engineers in transitioning the technology into a **trillion-dollar national defense program**.
- This work, initiated at the **CRCV under funding from Lockheed Martin**, culminated in a first-author, peer-reviewed **publication at a top-tier conference, CVPR 2018**.
- Applied deep learning expertise to lead and contribute to R&D projects across a diverse range of problems, including multi-agent planning, time-series prediction, radio modulation detection, and 3D scene understanding.

2014 – 2015 - Research Manager & Lead Developer, HiPerCiC Program - St. Olaf College

- Progressed through roles of increasing responsibility from Developer to Lead Developer to Research Manager within a **grant-funded digital humanities initiative**.
- Led a three-person research team in developing custom web applications to support scholarly research in a diverse range of disciplines including: **computational linguistics, archaeology, art history, and race & ethnic studies**.
- Formally acknowledged for **key contributions to the award-winning book, *Reconstruction in Alabama: From Civil War to Redemption in the Cotton South***, for my role as lead developer of its core digital mapping project.
- Co-designed and co-developed a full-stack web application for the college's alumni office to streamline and analyze fundraising outreach and data patterns.
- Provided development support for other campus partners, including the **student newspaper, digital media services, and the theater & dance department**.

2014 - Production Unit Leader - Fiat Chrysler Automobiles

- Directed the daily activity of over 30 union employees across 7 distinct production departments, demonstrating strong people management and cross-functional leadership skills.
- Analyzed production metrics to enhance cost-effectiveness and operational efficiency.

TEACHING & MENTORSHIP EXPERIENCE

Program Coordinator & AI Instructor, NSF Research Experience for Teachers (RET) Program - University of Central Florida - 2017 – 2018

- Developed and delivered a foundational curriculum in AI, Computer Vision, and Python to a cohort of 11 high school STEM teachers, equipping them to bring cutting-edge research into their classrooms.
- Co-designed summer research projects tailored to each teacher's expertise, recruiting university faculty and graduate students to serve as domain-specific co-mentors.
- Mentored the cohort through the full research lifecycle, organizing dissemination workshops and poster sessions, and guiding the development of their final, research-inspired lesson plans.
- Managed all program logistics: authored official progress reports for the NSF; conducted K-12 outreach, including classroom visits and student talks; and led the teacher recruitment and interview process.

Course Designer & Lead Instructor, HiPerCiC: Collaborative Web Apps - St. Olaf College - 2015

- Solely responsible for designing the complete curriculum for a new, project-based interdisciplinary course (ID 259), creating all lecture materials, tutorials, and homework assignments.
- Delivered all primary course lectures and technical tutorials on full-stack web application development, database design, and project management.
- Mentored and graded multiple student teams, each paired with a humanities professor, guiding them through the successful completion of a semester-long digital humanities project.

Guest Lecturer

- **At George Mason University - 2024**
 - *Management of Information Systems (MIS 415)*
- **At University of Central Florida - 2018 – 2019**
 - *Topics in Machine Learning (CAP 6614), Artificial Intelligence (CAP 4630), Robotic Vision (CAP 4453)*

Teaching Assistant & Tutor - University of Central Florida & St. Olaf College - 2013 – 2019

- **Teaching Assistant for:** *Operating System Concepts (CGS 3763), Artificial Intelligence (CAP 4630), Statistical Mechanics (Phys 379), Principles of Physics II (Phys 125), Analytical Physics I Lab (Phys 130L), Principles of Physics I Lab (Phys 124L)*
- **Tutor for:** *Calculus I & Calculus II (Math 120 & Math 126)*

Advanced Ice Hockey Instructor & Camp Director - Wizard Hockey - 2007 – 2017

- Designed and led advanced skill development programs for young athletes (aged 7 - 17) over a ten-year period.
- Co-directed tournaments, hockey camps, and private lessons that earned a corporate sponsorship from Warrior Hockey for excellence and professionalism.

Volunteer & Mentor - Boys & Girls Clubs of America - 2008 – 2009 & 2018

- Recognized as a Volunteer of the Year by the Soldotna Chamber of Commerce.
- Mentored less fortunate children by involving them in activities and special projects.
- Provided a positive environment and role model for children to have fun and learn with.

Volunteer & Mentor - Wichita Falls Wildcats - 2012

- Mentoring five under-performing local schools: aided students in learning to read, gave several presentations on good health and eating habits, spent time with students during gym to teach the importance of physical fitness for health.

PUBLICATIONS & PATENTS

Peer-Reviewed Publications

- **2024 - R. LaLonde**, N. Khosravan, and U. Bagci. "Deformable Capsules for Object Detection." *Advanced Intelligent Systems*, 6 (9), 2400044.
- **2022 - R. Yu, D. Du, R. LaLonde**, D. Davila, C. Funk, A. Hoogs, and B. Clipp. "Cascade Transformers for End-to-End Person Search." *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 7267-7276.
- **2021 - R. LaLonde**, Z. Xu, I. Irmakci, S. Jain, and U. Bagci. "Capsules for Biomedical Image Segmentation." *Medical Image Analysis*, 68, 101889.
- **2020 - R. LaLonde**, D. Torigian, and U. Bagci. "Encoding Visual Attributes in Capsules for Explainable Medical Diagnoses." *International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, 294-304. [MICCAI Student Travel Award]
- **2020 - R. LaLonde**, P. Kandel, C. Spampinato, M.B. Wallace, and U. Bagci. "Diagnosing Colorectal Polyps in the Wild with Capsule Networks." *IEEE 17th International Symposium on Biomedical Imaging (ISBI)*, 1086-1090.
- **2020 - S. Laha, R. LaLonde**, A.E. Carmack, H. Foroosh, J.C. Olson, S. Shaikh, and U. Bagci. "Analysis of Video Retinal Angiography with Deep Learning and Eulerian Magnification." *Frontiers in Computer Science*, 2, 24.
- **2019 - R. LaLonde**, I. Tanner, K. Nikiforaki, G.Z. Papadakis, P. Kandel, C.W. Bolan, M.B. Wallace, and U. Bagci. "INN: Inflated Neural Networks for IPMN Diagnosis." *International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, 101-109.
- **2019 - P. Kandel, R. LaLonde**, V. Ciofoaia, M.B. Wallace, and U. Bagci. "Su1741 Colorectal Polyp Diagnosis with Contemporary Artificial Intelligence." *Gastrointestinal Endoscopy*, 89 (6), AB403.
- **2018 - R. LaLonde** and U. Bagci. "Capsules for Object Segmentation." *Medical Imaging with Deep Learning (MIDL)*. [Oral Presentation, CIFAR Travel Award]
- **2018 - R. LaLonde**, D. Zhang, and M. Shah. "ClusterNet: Detecting Small Objects in Large Scenes by Exploiting Spatio-Temporal Information." *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 4003-4012.
- **2016 - H. Du, R. LaLonde**, R. van Mechelen, and S. Zhang. "Performing Semantic Segmentation on an Extremely Small Dataset." *Midwest Instruction and Computing Symposium (MICS)*.

Patents & Patent Applications

- **2024 - A. Patsekin, B. Radford, C. Derwin, D. Marasco, D. Wang, D. Lymperopoulos, E. Kang, K.J. Kim, M. Betten, M. Fedderly, M. Goraczko, P. Lei, P. Srikhanta, R. LaLonde**, S. Fackler, T. Shen, X. Li, and Y. Wu. "Systems and Methods for Object Tracking with Retargeting Inputs." *US Patent Application 18/583,045*.
- **2024 - A. Patsekin, B. Radford, C. Derwin, D. Marasco, D. Wang, D. Lymperopoulos, K.J. Kim, M. Goraczko, P. Lei, P. Srikhanta, R. LaLonde**, T. Shen, X. Li, and Y. Wu. "Systems and Methods for User-Assisted Object Detection." *US Patent Application 18/581,106*.
- **2024 - A. Patsekin, B. Radford, C. Derwin, D. Marasco, D. Wang, D. Lymperopoulos, E. Kang, K.J. Kim, M. Betten, M. Fedderly, M. Goraczko, P. Lei, P. Srikhanta, R. LaLonde**, S. Fackler, T. Shen, X. Li, and Y. Wu. "Systems and Methods for Single-Object Tracking Using Multiple-Object Tracking." *US Patent Application 18/581,644*.
- **2024 - J.A. Driscoll, A. Patsekin, B. Radford, D. Marasco, D. Lymperopoulos, E. VAN ANDEL, K.J. Kim, M. Cameron, M. Goraczko, M. Sackler, P. Srikhanta, R. LaLonde**, S. Ramsey, T. Shen, X. Li, and Y. Wu. "Systems and Methods for Multiple Sensor Object Tracking." *US Patent Application 18/647,042*.
- **2024 - A. Patsekin, B. Radford, D. Marasco, D. Lymperopoulos, K.J. Kim, M. Goraczko, P. Srikhanta, R. LaLonde**, T. Shen, X. Li, Y. Wu, C. Derwin, and D. Wang. "Systems and Methods for Multiple-Object Tracking." *US Patent Application 18/625,961*.
- **2022 - U. Bagci, R. LaLonde**, and N. Khosravan. "Deformable Capsules for Object Detection." *US Patent 11,514,579*.
- **2021 - U. Bagci and R. LaLonde**. "Capsules for Image Analysis." *US Patent 11,010,902*.
- **2021 - M.B. Wallace, C. Bolan, U. Bagci, and R. LaLonde**. "Systems, Methods, and Media for Automatically Diagnosing Intraductal Papillary Mucinous Neoplasms Using Multi-Modal Magnetic Resonance Imaging Data." *US Patent 11,064,902*.

PRESENTATIONS & INVITED TALKS

Invited Professional & Community Talks

- **2023** - "Theology, Humanity, & Artificial Intelligence." **Invited Speaker**, Community Lecture on Faith & Technology, Arlington, VA.
 - Event featured in *The Arlington Catholic Herald*.
 - Subsequently invited as a guest on the "*I Am Not A Robot with Dr. Jeremy Ray*" podcast to discuss this topic.
- **2022 - 2024** - *Monthly Machine Learning Lecture Series*, **Creator & Host**, Palantir Technologies.
- **2017** - *Weekly "Tech-Talk" Series on Computer Vision & Deep Learning*, **Creator & Host**, Lockheed Martin.
 - Talks broadcast company-wide, with invitations sent to over 9,000 engineers.
- **2017** - Presented doctoral research to multiple business areas at facilities in California, Colorado, and Florida. **Invited Speaker**, Lockheed Martin.
- **2016** - "A Student's Guide to CS Graduate School," **Invited Speaker**, St. Olaf College ACM Student Chapter, Northfield, MN.

Invited University Lectures

- **2024** - "A Brief Introduction to AI, Machine Learning, and Computer Vision." **Guest Lecturer**, *Management of Information Systems (MIS 415)*, George Mason University, Fairfax, VA.
- **2019** - "Neural Networks for Computer Vision I & II." **Guest Lecturer**, *Topics in Machine Learning (CAP 6614)*, University of Central Florida, Orlando, FL.
- **2018** - "Detecting Small Objects in Large Scenes." **Guest Lecturer**, *Artificial Intelligence (CAP 4630) & Robotic Vision (CAP 4453)*, University of Central Florida, Orlando, FL.

Conference Presentations & Tutorials

- **2020** - "Diagnosing Colorectal Polyps in the Wild with Capsule Networks." *IEEE 17th International Symposium on Biomedical Imaging (ISBI)*, Virtual. [**Oral** Presentation]
- **2019** - "Applications of Capsule Networks: Segmentation." Invited Speaker, *CVPR 2019 Tutorial on Capsule Networks*, Long Beach, CA.
- **2018** - "Capsules for Object Segmentation." *Medical Imaging with Deep Learning (MIDL)*, Amsterdam, NL. [**Oral** Presentation, CIFAR **Travel Award**]
- **2018** - "ClusterNet: Detecting Small Objects in Large Scenes..." *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, Salt Lake City, UT. [Poster Presentation]

MEDIA COVERAGE & INTERVIEWS

Featured Story

- **2019** - "AI an emerging tool, not substitute, for oncologists." Featured as cover story in *HemOnc Today* magazine.

Television & News Interviews

- **2019** - Interviewed by multiple national and local news outlets regarding research on AI for early cancer detection. Appearances include:
 - **ABC30 News**, "Health Watch: Using AI to Stop Cancer in its Tracks"
 - **ABC7 News**, "Researchers Using Artificial Intelligence To Detect Early Signs of Lung, Pancreatic Cancers"
 - **Fox35 News**, "Health Watch: Doctors Using Facial Recognition Technology To Save Your Life"
 - **WNDU16 News**, "Using AI to Stop Cancer in its Tracks"
 - **WQAD8 News**, "Your Health: Detecting the deadliest cancers with computer programming"

GRANT & PROPOSAL EXPERIENCE

Lead Author & Key Contributor, Kitware, Inc.

- Served as a key contributor and technical lead on a successful multi-institutional **IARPA** proposal, securing nearly **\$40M** in funding for a team including academic collaborators from the University of Maryland, UCF, UNC-Chapel Hill, and UT Dallas.
- Led a successful Phase II Small Business Innovation Research (**SBIR**) proposal, securing **\$750K** in funding and managing collaboration with faculty and students at The Ohio State University.

Proposal Author & Researcher, Palantir Technologies & Lockheed Martin

- Authored and contributed to numerous internal research and development (IRAD) proposals, white papers, and formal responses to customer Requests for Proposals (RFPs) and Requests for Information (RFIs).

Graduate Co-Author, University of Central Florida

- Co-authored the following successfully funded major grants:
 - **"RCAI: Radiologist Centered Artificial Intelligence."**
 - *Funding Agency:* National Institutes of Health (NIH) - National Cancer Institute (NCI).
 - *Award:* **\$2.5M** over 5 years (scored in 5th percentile).
 - **"Cyst-X: Interpretable Deep Learning Based Risk Stratification of Pancreatic Cystic Tumors."**
 - *Funding Agency:* National Institutes of Health (NIH) - National Cancer Institute (NCI).
 - *Award:* **\$2.5M** over 5 years (scored in 11th percentile).
 - **"Predicting Outcomes of Lung Cancer Therapy Through Explainable Deep Learning."**
 - *Funding Agency:* Florida Department of Health.
 - *Award:* **\$1.1M** over 3 years.
- Contributed to securing a **\$50K** seed grant from the Mayo Clinic and UCF for the "Development of Computer Aided Detection (CAD) and Diagnosis Tool for Elucidating the Difference Between Pancreatic Cystic Tumors."

PROFESSIONAL SERVICE

Tutorial Co-Organizer, "Tutorial on Capsule Networks," *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019.

Review Panelist, Opioid Detection Challenge, funded by the Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), and others.

Peer Reviewer for top-tier conferences and journals including *CVPR*, *ECCV*, *MICCAI*, *MIDL*, *TMI*, *WACV*, *ISBI*, *PLOS One*, *Medical Physics*, and *EMBC*.

LEADERSHIP & ATHLETIC EXPERIENCE

Team Captain, ACHA Ice Hockey – University of Central Florida

- Elected Assistant Captain (2017-2019) and Team Captain (2019-2020).
- Two-time recipient of **all-conference** and **all-regional awards** for on-ice performance.

Team Captain, NCAA & Club Ice Hockey – St. Olaf College

- Initially recruited to play for the college's NCAA D3 team; transitioned to captaining the club team after freshman year to successfully pursue a rigorous triple major in Computer Science, Physics, and Mathematics.