Rogelio Gracia Otalvaro

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PROFESSIONAL SUMMARY

Ph.D. Candidate in Computer Science and Electrical Engineering at Embry-Riddle Aeronautical University with expertise in resilience engineering, machine learning, and complex systems analysis. Experienced in leading cross-functional research on bifurcation analysis, aerial robotics, and AI applications for critical infrastructure and aerospace, with 10+ conference and symposium publications. Skilled in data analytics, cloud computing, and simulation modeling, applying tools such as Python, MATLAB, AnyLogic, and Power BI to deliver data-driven insights. Proven leader with international experience in academia, research, and industry, combining strong technical expertise with project management, teaching, and mentoring.

PROFESSIONAL EXPERIENCE

ERAU – ***Graduate Research / Teaching Assistant*** **Aug 2021 – Current, Daytona Beach, FL, USA**

- Led machine learning and AI data-driven initiatives in the BID4R lab, directing cross-functional research teams to develop analytical solutions for critical infrastructure and aerospace applications
- Conducted research in resilience engineering, bifurcation analysis of complex systems, bio-inspired design, aerial robotics for civil operations, machine learning, cloud computing, and deep learning applications
- Presented and published findings in 10+ conference and symposium proceedings, such as the INCOSE International Symposium and the ASME International Design Engineering Technical Conferences
- Developed and delivered course content for Dynamics, Modern Controls, and Electrical Engineering courses instructing more than 150 scholars through hands-on labs, and contributed to the design of three new classes for graduate programs
- Utilized MATLAB, Python, AnyLogic, and Cloud services to model and study complex dynamic systems, optimizing stability and informing risk mitigation strategies

IMAGINE + INVERSION – ***Associate Financial Analyst*** **Feb 2021 – Aug 2021, Madrid, Spain**

- Engineered a data mining strategy utilizing SQL and Excel to evaluate 700+ companies, successfully segmenting prospects and achieving a 50% reply rate from decision-makers
- Delivered data-driven BI presentations to investment committees, translating analyses, valuations, and financial statements into clear, actionable recommendations for stakeholders
- Built financial models to assess tech startups' growth potential, aligning findings with strategies to enhance long-term investor value

BALLESOL – ***Project Manager*** **Oct 2018 – Jan 2020, Madrid, Spain**

- Lead the creation and implementation of a centralized business model that unified brand strategy and streamlined group purchasing, reducing operational costs by 30% through centralized cost-control initiatives
- Monitored operational efficiency across 45+ residential sites using custom KPIs for logistics and engineering projects, reducing delivery timelines by 20% via targeted process improvements

EDUCATION

Embry-Riddle Aeronautical University — **Daytona Beach, FL, USA**

- Ph.D. in Computer Science and Electrical Engineering (GPA 4.0/4.0) — 2023 - Current
- Master of Science in Mechanical Engineering (GPA 3.83/4.0) — 2021 – 2022

ICAI Universidad Pontificia de Comillas — **Madrid, Spain**

- Master of Science in Industrial Technologies Engineering (Thesis: 9.5/10) — 2020 - 2022
- Bachelors in Industrial Technologies Engineering (Major: Electronics & Automation, Thesis: 9.5/10) — 2015 - 2020

SKILLS & KNOWLEDGE

- **Languages:** Spanish (Native), English (Fluent, TOEFL 112/120)
- **Data & Analytics:** Python, SQL, MATLAB & Simulink, Power BI, Excel, AnyLogic, CSS, HTML
- **Engineering & Development Platforms:** Google Cloud Platform (GCP), PyTorch, C++, Java, Linux, JavaScript, React, Unity 3D
- **Office & PM Tools:** Microsoft Office Suite, Teams, Outlook, Trello, Scrumwise (Agile), Jira
- **Soft Skills:** Analytical Thinking | Proactive Problem-Solving | Teamwork & Leadership | Fast Learner | Creative | Working Under Pressure

LEADERSHIP & VOLUNTEERING

PADI Divemaster, Professional Scuba Diver. Participated in more than 400 dives in 10+ countries. 100+ as a guide.
Member of the World Wildlife Fund (WWF). Participated in oriented trips to raise awareness for environmental problems.

RESEARCH ARTICLES

1. **Gracia Otalvaro, R.,** & Watson, B. C. (2024, July). *A framework to use bifurcation analysis for insight into complex systems resilience*. INCOSE International Symposium, 34(1), 2384–2399. https://doi.org/10.1002/iis2.13276
2. **Gracia Otalvaro, R.,** & Watson, B. C. (2024, August). *Barriers to sustainable system evolution: A simulation study exploring the transition from private to public transportation*. International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (Vol. 88391, pp. V005T05A015). American Society of Mechanical Engineers. https://doi.org/10.1115/DETC2024-143201
3. **Gracia Otalvaro, R.** (2024). *Diseño de una herramienta gráfica para facilitar el análisis y diseño de sistemas eléctricos basada en recursos de código abierto* [Master's thesis, Universidad Pontificia Comillas]. https://hdl.handle.net/11531/87868
4. **Gracia Otalvaro, R.** (2020). *Aplicación de la realidad aumentada para el mantenimiento de equipos industriales* [Bachelor's thesis, Universidad Pontificia Comillas]. https://hdl.handle.net/11531/41255
5. **Gracia Otalvaro, R.,** & Watson, B. C. (under review). *Evaluating complex system resilience through BARD: A bifurcation analysis for resilience diagnostics framework*. INCOSE Systems Engineering Journal.
6. **Gracia Otalvaro, R.,** & Watson, B. C. (under review). *A Soft Actor-Critic Reinforcement Learning Controller for Ground Target Tracking*. AIAA SciTech Forum 2026.
7. **Gracia Otalvaro, R.** (2024). *ADS-B security: A critical review and proposed machine learning defense mechanism* (Qualifying exam report). Embry-Riddle Aeronautical University.
8. **Gracia Otalvaro, R.** (2024). *Optimizing flight operations: Data-driven strategies to combat air traffic delays caused by weather and congestion* (Qualifying exam report). Embry-Riddle Aeronautical University

TEACHING EXPERIENCE

Embry-Riddle Aeronautical University – Daytona Beach, FL, USA
Graduate Teaching Assistant / Instructor | Aug 2021 – Current

- **EE 327 Electrical Engineering Fundamentals (Fall 2025, 90+ students)** – Taught fundamentals of circuit theory, AC/DC analysis, phasors, transient response, and digital logic. Delivered lectures, assignments, and assessments to large undergraduate groups.
- **SYS 699 Special Topics in Systems Engineering: Complex System Modeling (Summer 2023)** – Designed and created an original graduate-level course on system dynamics and agent-based modeling of complex systems. Incorporated examples from my own research to guide student projects in modeling real-world systems.
- **EE 402 Control Systems Laboratory (Spring 2023, +10 students)** – Served as lab instructor, guiding students through instrumentation, modeling, and experimentation on dynamic systems. Emphasized system identification, state feedback, and controller implementation.
- **EE 401 Control Systems Analysis and Design (Spring 2023, 30+ students)** – Assisted Dr.Pang in grading and instructional support for advanced undergraduate course on analog and digital control, stability, frequency domain methods, and controller design.
- **ME 595FF Dynamic Systems, Stability, and Control (Fall 2021 and Spring 2022, ≈10 students)** – Designed full course content covering nonlinear dynamics, stability theory, Lyapunov methods, and robust control. Developed modules, assignments, and projects that were integrated into ERAU's ME graduate curriculum. Then, assisted Dr. Mirmirani during the course.
- **ES 204 Dynamics (Fall 2021, +30 students)** – Teaching Assistant for a 3-credit undergraduate course covering kinematics, kinetics, energy methods, and momentum. Helped Dr. Mirmirani in lectures, content creation, grading, and office hours for students.

AWARDS & GRANTS

- **SCEEE Development Grant** – *Combining Biological Inspiration, Machine Learning, and Graph Theory to Improve Early-Stage Electric Grid Transient Response Design*
  Role: Investigator | **Amount:** $80,000 | **Dates:** Aug 1, 2024 – Jul 31, 2025
- **Philanthropy Council Grant (2024)** – Awarded **$4,000** in support of UAV Swarm Navigation for Search and Rescue Missions, funding two mid-range workstations for research.
- **Graduate Research Symposium, 2024** – *Poster Competition*: Second Place & People's Choice Award ($500).
- **SPARK Travel Grant (2024–2025)** – $900 awarded for research dissemination and conference participation.
  SPARK Travel Grant (2023–2024) – $700 awarded for research dissemination and conference participation.
- **Frontiers in Engineering Design Research Summer School (FinDER), 2023** – Selected participant; received full travel, lodging, and meals support.

PROFESSIONAL MEMBERSHIPS

- **Member International Council on System Engineering (INCOSE)** **2023- Ongoing**
- **Member American Society of Mechanical Engineers (ASME)** **2024- Ongoing**