

CANSU YALIM ERTURUN, PH.D.

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EDUCATION

Old Dominion University, Virginia, USA

2022 – 2026

Doctor of Philosophy (Ph.D.) in Engineering Management and Systems Engineering · GPA: 4.0 / 4.0

- Research interest: systems engineering and digital engineering for complex and safety-critical systems; modeling, simulation, and digital twins for system-of-systems analysis and resilience; AI-enabled decision support and human-in-the-loop systems; causal inference, Bayesian state estimation, and data-driven diagnosis under uncertainty; predictive maintenance and condition monitoring; semantic assurance and lifecycle traceability of engineering artifacts; trustworthy AI and automation for systems engineering; and human-centered evaluation of sociotechnical systems.
- Dissertation: A Causal Inference Methodology for Root-Cause Diagnosis in Nonstationary Industrial Time Series

Celal Bayar University, Manisa, Turkiye

2020 – 2022

M.S., Engineering Management · GPA: 3.98 / 4.0

Izmir University of Economics, Izmir, Turkiye

2015 – 2020

B.S., Industrial Engineering · GPA: 3.54 / 4.0

PROFESSIONAL EXPERIENCE

Research Scientist

September 2026 – Present

Old Dominion University, Virginia, USA

- Conduct interdisciplinary research in computer vision, 3D imagery, machine learning, artificial intelligence, and robotics.
- Develop and apply vision foundation models, spatial reasoning methods, physics-informed modeling, and simulation-based approaches for AI-enabled engineered systems.
- Design, implement, and evaluate machine learning and AI methods using Python, MATLAB, and C++ across real-world, simulated, and multimodal data.
- Collaborate with faculty, research scientists, engineers, and extension personnel on interdisciplinary research projects and technical initiatives.
- Conduct independent and collaborative research, contributing to research methodology, experimental design, model development, validation, and technical analysis.
- Contribute to peer-reviewed publications, conference presentations, technical reports, and other research dissemination activities.
- Communicate research findings through regional and national meetings and other academic, industry, and professional forums.
- Collaborate with industry organizations, state and federal agencies, and external stakeholders on research and technical activities related to project objectives.
- Contribute to research proposals, grant applications, journal manuscripts, and technical publications, including proposal and manuscript review within areas of expertise.
- Participate in professional and technical societies, research organizations, conferences, workshops, and interdisciplinary outreach activities.
- Support the advancement and dissemination of research across academic, industry, government, and nonprofit environments.

Adjunct Assistant Professor

August 2026 – Present

Old Dominion University, Virginia, USA

- Teach Statistical Concepts for Engineering Management (ENMA 420), Systems Architectures (ENMA 660), and Project Capstone (ENMA 605) courses.

AI Research Analyst / Subject Matter Expert

September 2026 – Present

Elsevier Physical Sciences and Engineering Journals (Remote in the USA)

- Evaluate AI-generated engineering and scientific research content for technical accuracy, relevance, completeness, methodological soundness, and practical usefulness.
- Serve as a Subject Matter Expert for engineering-focused content, applying domain expertise to assess technical claims, equations, standards, and research methods.
- Assess the quality, authority, and applicability of academic references, engineering standards, technical codes, and scientific sources.
- Identify hallucinations, unsupported claims, fabricated citations, and misapplied references in AI-generated research outputs.
- Provide structured, evidence-based evaluations using formal quality rubrics and document clear rationale for technical scoring decisions.
- Review whether AI-generated claims are appropriately grounded in cited literature and established engineering knowledge.
- Support quality assurance and reliability of AI-assisted research and scientific publishing workflows.
- Contribute to responsible AI evaluation by helping ensure research content is accurate, trustworthy, and technically rigorous.

Graduate Teaching Assistant Instructor

Aug 2025 – August 2026

Old Dominion University, Virginia, USA

- Teach Engineering Managerial Economics (ENMA 302), covering cost estimation, managerial accounting, and key financial metrics; valuation and the time value of money; discounted cash-flow analysis (NPV, IRR, payback) with sensitivity and scenario analysis; and the economic evaluation of engineering alternatives including depreciation methods, income tax effects, inflation, and risk. The course extends to capital budgeting for single projects, portfolios, and public-sector investments (benefit-cost analysis). Responsibilities include syllabus design, lectures, case-based problem sets, and mentoring teams on project appraisals.
- Teach Statistical Concepts for Engineering Management (ENMA 420), a senior/master's-level probability and statistics course covering descriptive statistics, probability, key distributions, estimation, and hypothesis testing, extending to regression, process control, and reliability with emphasis on engineering design, manufacturing, and quality assurance applications. Developed the online version of ENMA 420 in collaboration with ODUGlobal, contributing to course design, digital pedagogy, and asynchronous learning experience.
- Teach Systems Architectures (ENMA 660: online and in-person), focusing on the systems architecture paradigm through multiple frameworks and enterprise engineering, with hands-on systems modeling (UML, SysML). Responsibilities include syllabus design, interactive lectures for both formats, modeling assignments, and mentoring student teams on architecture projects.

Graduate Research Assistant

Aug 2022 – August 2026

Old Dominion University, Virginia, USA

- Human-in-the-loop frameworks, cognitive enterprise modeling, Active Inference, and application of human readiness levels to AI-intensive sociotechnical systems.
- Model-Based Systems Engineering, Unified Architecture Framework (UAF) integration, synergistic decision support, and generative AI for systems architecture.
- Resilient digital twin environments, mission engineering, and anomaly detection for complex infrastructures such as power grids.
- Root-cause diagnostics for nonstationary time series data, sequential Bayesian state estimation, condition monitoring, and remaining useful life estimation.
- Energy-efficient human activity recognition, co-design of energy sensing and diagnostics, and multi-dataset analysis of energy/accuracy trade-offs in wearable health monitoring.

Workforce Planning Engineer

Oct 2021 – Sep 2022

CMS Group Light Alloy Wheels, Izmir, Turkiye

- Analyzed production processes, labor requirements, and capacity constraints to identify workforce needs and develop staffing strategies.
- Collaborated across production sections (molding, melting, laundry, machining, paint shop), logistics, and human resources on workforce planning alignment.
- Designed, implemented, and monitored KPIs to track workforce efficiency and recommend action plans.

- Developed workforce planning models to forecast labor demand, identify skill gaps, and support strategic decisions.
- Conducted scenario and sensitivity analyses to assess the impact of production and demand changes on workforce requirements.
- Evaluated existing workforce management practices and recommended process improvements to enhance efficiency and reduce costs.
- Monitored industry trends and emerging technologies in workforce planning to maintain organizational competitiveness.

Business Excellence Engineer

Oct 2019 – Oct 2021

Bosch Thermotechniek, Manisa, Turkiye

- Deployed the Bosch Production System (BPS) approach and lean management tools.
- Collaborated cross-functionally to ensure seamless integration of BPS and lean management principles.
- Conducted external and internal audits to assess BPS deployment effectiveness and standards compliance.
- Managed cross-functional project teams executing System Continuous Improvement (S-CIP) projects.
- Administered the idea management system and organized management-level tours, workshops, and meetings.
- Developed plant value stream maps and process designs for source/make/deliver functions.
- Built performance-tracking systems to monitor continuous improvement initiatives and report results to management.

RESEARCH & PUBLICATIONS

Selected Publications

- Yalim, C., & Erturun, U. (2026). Energy-efficient human activity recognition on self-powered wearables: The sampling-rate and model-complexity Pareto frontier. Manuscript submitted for publication to the International Journal of Intelligent Systems.
- Yalim, C., & Erturun, U. (2026). Data-driven feasibility of self-powered wearable health monitoring: A multi-dataset analysis of energy-accuracy trade-offs. Manuscript submitted for publication to the International Journal of Energy Research.
- Yalim, C., & Erturun, U. (2026). Self-powered wearable health monitoring: A systems perspective on the energy-sensing-diagnostics co-design. Manuscript submitted for publication to the International Journal of Intelligent Systems.
- Yalim, C., & Erturun, U. (2026). Self-powered condition monitoring of rolling element bearings: Linking vibration energy harvesting to remaining useful life estimation. Manuscript submitted for publication to Quality and Reliability Engineering International.
- Yalim, C. (2026). Sequential Bayesian state estimation for system-of-systems project portfolios: Closing the cognitive loop under uncertainty. Manuscript submitted for publication to Systems Engineering.
- Yalim, C. (2026). A proof-of-concept evaluation of the resilient digital twin with human-in-the-loop framework for power grid system-of-systems resilience. Manuscript submitted for publication to Systems Engineering.
- Yalim, C., & Erturun, U. (2026). The Cognitive Enterprise: Engineering Management in the Age of Active Inference and Industry 5.0. Paper accepted at the American Society for Engineering Management (ASEM) International Annual Conference 2026.
- Soule, R., Yalim, C., Unal, R., & Handley, H. A. H. (2026). Human-centered mission RAG: A sociotechnical framework for intelligent team alignment in mission engineering. Paper accepted for presentation at the Annual Conference on Systems Engineering Research (CSER).
- Yalim, C., Soule, R., Unal, R., & Handley, H. A. H. (2026). A human-in-the-loop framework for enhancing system-of-systems resilience via AI-driven anomaly detection in digital twin environments. Paper accepted for presentation at the Annual Conference on Systems Engineering Research (CSER).
- Yalim, C., Unal, R., & Handley, H. A. (2026). A three-stage causal root-cause diagnostic protocol for nonstationary industrial time series data. *International Journal of Intelligent Systems*, 2026(1), 3436744.
- Yalim, C., & Handley, H. A. H. (2025). Application of the human readiness levels to AI-intensive systems. In *Proceedings of MODSIM World 2025* (Paper No. 0018). National Training and Simulation Association (NTSA).
- Yalim, C., & Handley, H. A. H. (2025). Execution of the information model for synergistic decision support using IMPRINT simulation. In *Proceedings of the 2025 IEEE International Systems Conference (SysCon)* (pp. 65–71). IEEE.
<https://doi.org/10.1109/SysCon64521.2025.11014786>

- Yalim, C., & Handley, H. A. H. (2025). Integrating data management plans into the Unified Architecture Framework standards views. *Systems Engineering (Wiley)*, 28(6), 750–761. <https://doi.org/10.1002/sys.70002>
- Handley, H. A. H., & Yalim, C. (2024). An information model for synergistic decision support. In *Proceedings of the 2024 IEEE International Systems Conference (SysCon)* (pp. 15–19). IEEE. <https://doi.org/10.1109/SysCon61195.2024.10553604>
- Yalim, C., & Handley, H. H. (2024). Integrating generative artificial intelligence with systems architecting diagram creation: Advancement, challenges, opportunities and future perspectives [Paper presentation]. ASEM 2024 International Annual Conference, Virginia Beach, VA.
- Yalim, C., Mohanty, J., Kovacic, S. F., & Handley, H. H. (2023). Automated prioritization of maintenance work orders: A sentiment analysis approach using natural language processing. In *Fleet Maintenance & Modernization Symposium (FMMS 2023)* (pp. 21–25). American Society of Naval Engineers.

HONORS, AWARDS & CERTIFICATIONS

- Best Paper Award, MODSIM World 2025 Conference
- Dr. Barry Boehm Research Excellence Award, Systems Engineering Research Center, April 2026
- Best Poster Presentation, ODU Batten College of Engineering & Technology, 2026 ODU Knowledge & Creativity Expo
- U.S. Military Sealift Command Research Grant — Co-Principal Investigator, “Sentiment Analysis Implementation to MSC Maintenance Work Orders Prioritization” (2023–2024)
- U.S. Military Sealift Command Research Grant — Co-Principal Investigator, “Hyperspectral Sensor Analysis” (ongoing)
- Volunteer Judge, Virginia State Science Fair
- High Honour Student, Manisa Celal Bayar University, 2022
- High Honour Student, Izmir University of Economics, 2020

PEER REVIEW

- *Electronics Letters Journal* (Wiley)
- IEEE International Symposium on Systems Engineering, 2026
- INCOSE Conference on Systems Engineering Research (CSER), 2026
- IEEE Energy Conversion Conference and Expo, 2026
- IEEE International Conference on Recent Advances in Systems Science and Engineering, 2025 & 2026
- IEEE International Systems Conference, 2025
- ASEM International Annual Conference, 2024 & 2026
- *Handbook of Sociotechnical Systems: A Human Systems Integration Approach*

SKILLS

Programming Languages: Python, R, Java

Tools & Methods: IMPRINT, Simio, Arena, Power BI, CloudCompare, Blender

Languages: Turkish (Native/Bilingual); English (Professional Working); German (Limited Working); Spanish (Elementary)