Christopher Shneider Cerqueira, Ph.D.

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RESEARCH INTEREST

Model based Systems Engineering, Multi-domain Operations, Concurrent Engineering, Complexity, Modeling and Simulation, Systems Engineering Languages and Human-Machine Interaction.

EDUCATION

Doctor of Philosophy in Space Technology and Engineering   FEB 2018

- Instituto Nacional de Pesquisas Espaciais - INPE (Brazilian Institute of Space Research), São José dos Campos, São Paulo, Brazil
- Thesis Title: Tangible Collaboration applied into Space Systems Concurrent Engineering Concept Studies
- Advisor: Prof. Dr. Ana Maria Ambrosio

Master of Science in Space Technology and Engineering   FEB 2014

- Instituto Nacional de Pesquisas Espaciais - INPE (Brazilian Institute of Space Research), São José dos Campos, São Paulo, Brazil
- Dissertation Title: Virtual Reality Techniques employed into Satellite Operational Simulators
- Advisors: Prof. Dr. Walter Abrahão dos Santos and Prof. Dr. Ana Maria Ambrosio

Bachelor on Computer Engineering   DEC 2010

- Universidade Federal de Itajubá - UNIFEI (Federal University of Itajubá), Itajubá, Minas Gerais, Brazil
- Capstone Project Title: Augmented Reality applied to Science Museums
- Advisors: Prof. Dr. Roberto Affonso da Costa Junior and Prof. Dr. Edson Oliveira de Jesus

Professional Technical Degree on Industrial Informatics   DEC 2003

- Escola Técnica Professor Everardo Passos - ETEP (Professor Everardo Passos Professional School), São José dos Campos, São Paulo, Brazil
- Capstone Project Title: Embedded Color Selector
- Advisor: Prof. Ronaldo Vaquelli.

RESEARCH EXPERIENCE

Instituto Tecnológico de Aeronáutica - ITA (Aeronautics Institute of Technology)

CONCEPTIO - Complex Systems Design Research Lab (2024-2025)

I was invited in 2022 to lead two research projects of the partnership between Brazil and Sweden regarding the study of the Air Domain of the future - called Air Domain Study (ADS) Program. As I was hosted inside the ITA Space Center, it required the creation of a new infrastructure for specific research into the topics aligned with this Swedish Partnership. In March 2024, we formally established the CONCEPTIO lab (www.conceptio.ita.br). The laboratory's mission is to advance research on the design of complex systems through Systems Engineering, Modeling and Simulation, Game Technologies, and Natural Interfaces, supporting defense systems users and stakeholders. We maintained a project-based learning approach, enabling students to fund their studies while solving real-world problems.

The CONCEPTIO focus on two pillars:

- MBSE (Model Based Systems Engineering) - application of models in systems, system of systems, identifying gaps of this application, researching the systems engineering languages, as well as delivering the conceptual designs to the Armed Forces and/or under request by industry.
- XR (Extended Reality) - application of game technologies and natural user interfaces to create better experiences for systems modelers, rethinking the way the systems engineers interact with the model; and also providing to the stakeholders' better methods to see the systems models being simulated into the designed Concept of Operations.

During this period two ADS related projects:

- Virtual Demonstrator project. This project is part of a Brazil-Sweden (ITA /XMOBOTS / Linköping University /Saab) partnership into studies of the air domain of the future. This project establishes a multi-domain arena to demonstrate/simulate heterogenous systems.
- Safe Integration of different Manned and Unmanned Aircrafts into non-segregated air space. This project is also part of a Brazil-Sweden (ITA / DECEA - Brazilian Airspace Control Authority Department / ICEA - Brazilian Institute for Research of the Airspace Control / XMOBOTS / ATECH/ Linköping University / LFV - Luftfartsverket / Saab) partnership. This project simulates the safe integration from strategic to tactical conflict management into airspace with the inclusion of remote piloted aircrafts.

More information about the projects: https://cscerqueira.com.br/projs/

CEI - ITA Space Center (2018-2023)

The Space Center (www.cei.ita.br) is responsible for the capacitation of human-resources for the Brazilian Space sector. Its activities are described by the Space Systems Strategic Plan of the Brazilian Air Force to prepare the next generation of professionals that will contribute for the

development and operation of space assets. As growing strategy, the center uses project-based learning, as a tool to make the students/collaborators to pass through a full satellite life cycle. Despite assisting on the facility building, inauguration, and administrative activities, I was able to:

- apply MBSE in all Strategic Satellite Projects studied by the Air Force over the time frame - researching better ways to present the models to stakeholders and strategies to interact with the models;
- implement a Concurrent Design Facility, addressing the four main elements: (i) facility - structuring the room with the layout to improve communication on design; (ii) process - structuring a basic simple process to allow student-based architecture and design sprints; (iii) tools - structuring the set of interconnectable tools to do integrated design; and (iv) the integrated design model - structuring a single source of information to the whole process;
- collaborate into the SPORT (Scintillation Prediction and Observation Research Task) CubeSat, where I was the researcher responsible for the MBSE, systems architecture, requirement definition and software architecture - mentoring 6 students. During this collaboration I was involved at the PDR (Preliminary Design Review) and CDR (Critical Design Review), as well as the design of the flat-sat testing procedures;
- collaborate into Cybersecurity Studies, where I was the researcher responsible for the implementation of a MBSE CONOPs of a critical cybersecurity organization, joining JADO (joint all domain operations) with RPG (rolling playing games) to test a problematic situation captured by a Soft Operational Research team.

Universidade Federal de Itajubá - UNIFEI (Federal University of Itajubá)

On the end of my under-graduation capstone project, I had the opportunity to work on my supervisor lab, into the project ATIRA-MCT (Thematic Interactive Environment based on Augmented Reality for Museums of Science and Technology). I was responsible for the development of an Augmented Reality tool for use by professors and museums. The tool was called basAR (Behavioral Authoring System for Augmented Reality).

basAR was an Augmented Reality Environment to create and use applications where behavior can be programmed to enhance the augmented experience. Some application examples are puzzles, building guides, schooling, games, etc. basAR applications are based on a concept of action points. Action points are the center of reactive zones from the Structure Layer that are placed relatively of Infrastructure Layer object, in the base Marker. The Actuator Layer object, the Actuator Marker, also has an action point. The virtual collision between a structure action point and an actuator action point, or structure action point and another structure action point carried by the actuator action point provokes a reaction. On basAR the collision reaction or collision feedback can be dynamically configured on the authoring mode.

More information available at: https://www.youtube.com/watch?v=LzkKjvTOgiI

PUBLICATIONS

JOURNAL ARTICLES

- [J15] AVELINO, A.; CAETONO, M.; **CERQUEIRA**, C.S.; CORREIA, A.R.; SILVA, E.J.; COSTA, R.M. A Hybrid Airspace Model for Utilizing Drones in Logistics Operations. Soft Computing (2026). https://doi.org/10.1007/s00500-025-11027-7
- [J14] COGO, M.C.; MUENCHEN, C.; **CERQUEIRA**, C.S.; VILLANI, E. Inconsistency detection methods for statecharts and sequence diagrams: a systematic literature review. Spectrum, vol. 26, no. 1, pp. 43–48, Sep. 2025. https://doi.org/10.55972/spectrum.v26i1.427
- [J13] OLIVEIRA, A.M.; **CERQUEIRA**, C.S.; A systematic review of MDO methods applied to launch vehicle design and their contributions to concurrent engineering. Discover Mechanical Engineering. Volume 4, article number 19, (2025). https://doi.org/10.1007/s44245-025-00104-8
- [J12] PLEFFKEN, D, R.; **CERQUEIRA, C.S.** Incorporating military certification practices in the aerospace industry for enhanced safety and compliance. Observatorio de la Economia Latino Americana, v. 22, p. e5907, 2024. http://dx.doi.org/10.55905/oelv22n7-217
- [J11] MOREIRA, G. M. B.; **CERQUEIRA, C.S.**; SANTOS, W. G. Spaceworthiness: the future of space products safety. Observatorio de la Economia Latino-americana, v. 22, p. e5722, 2024. http://dx.doi.org/10.55905/oelv22n7-108
- [J10] BARROS, P. R. S.; COELHO, R. C.; **CERQUEIRA, C.S.**; LOUREIRO, G. Experiences with using ears for stakeholder requirements development of the safe integration of unmanned aircrafts in the airspace project. Observatorio de la Economia Latino Americana, v. 22, p. 2876-2890, 2024. http://dx.doi.org/10.55905/oelv22n1-152
- [J09] CUSTÓDIO, S. S. D.; **CERQUEIRA, C.S.** Aprendizagem por Projetos no Ensino de Engenharia Aeroespacial e Aeronáutica. Observatorio de la Economia Latino-americana, v. 22, p. 794-810, 2024. http://dx.doi.org/10.55905/oelv22n1-042 (Project-by-project learning in the teaching of aerospace and aeronautical engineering)
- [J08] BARBOSA, L. M.; **CERQUEIRA, C.S.**; DA CUNHA, A. E. C. Natural language requirements boilerplates: an integrative literature review. REVISTA DE GESTÃO E SECRETARIADO, v. 14, p. 13444-13476, 2023. http://dx.doi.org/10.7769/gesec.v14i8.2610
- [J07] **CERQUEIRA, C.S.**; AMBROSIO, ANA MARIA; KIRNER, CLAUDIO. Tangible user interface vocabulary to physically enhance space systems engineering tools. Concurrent Engineering Research and Applications, v. 1, p. 1063293X1987550, 2019. http://dx.doi.org/10.1177/1063293X19875505
- [J06] **CERQUEIRA, C.S.**; RODRIGUES, ITALO PINTO; MOREIRA, C. J. A.; CARRARA, VALDEMAR; AMBROSIO, ANA MARIA; KIRNER, CLAUDIO. Utilização de Realidade Virtual, Aumentada e Cruzada em Simuladores de Satélites no INPE. Tendências e Técnicas em Realidade Virtual e Aumentada, v. 5, p. 139-159, 2015 (Use of Virtual, Augmented and Crossed Reality in Satellite Simulators at INPE)
- [J05] **CERQUEIRA, C.S.**; KIRNER, CLAUDIO; AMBROSIO, ANA MARIA. Construção de Interfaces on-demand baseadas em Realidade Aumentada Projetiva para Controle de Hardware. Tendências e Técnicas em Realidade Virtual e Aumentada, v. 5, p. 240-260,

2015. (Construction of on-demand Interfaces based on Projective Augmented Reality for Hardware Control.)

- [J04] **CERQUEIRA, C.S.**; KIRNER, CLAUDIO. Construção de aplicações de Realidade Cruzada Projetiva utilizando openFrameworks e ARDUINO. Tendências e Técnicas em Realidade Virtual e Aumentada, v. 4, p. 103-136, 2014. (Construction of Projective Cross Reality applications using openFrameworks and ARDUINO)
- [J03] **CERQUEIRA, C.S.**; KIRNER, C. Introdução à utilização de openFrameworks para o desenvolvimento de aplicações de RVA. Tendências e Técnicas em Realidade Virtual e Aumentada, v. 3, p. 250-278, 2013. (Introduction to the use of openFrameworks for the development of VR / AR applications)
- [J02] AMBROSIO, A. M.; **CERQUEIRA, C.S.**Development of an Interface to a Spacecraft Simulator empowered by Virtual Reality. SBC Journal on 3D Interactive Systems, v. 3, p. 37-44-44, 2012.
- [J01] **CERQUEIRA, C.S.**; KIRNER, CLAUDIO. Desenvolvimento de uma aplicação de realidade aumentada sobre conceitos de revolução e extrusão de polígonos. RENOTE. Revista Novas Tecnologias na Educação, v. 9, p. 1-10, 2011. (Development of an augmented reality application on concepts of revolution and polygon extrusion)

BOOK CHAPTER

- [B02] SOUZA, Y. L.; MOREIRA, M. A. L.; SILVA, B. T. R. V.; BELDERRAIN, M. C. N.; **CERQUEIRA, C.S.**; SANTOS, M.; GOMES, C. F. S. Multimethodology Exploitation Based on Value-Focused Thinking: Drones Feasibility Analysis for National Defense. Innovations in Mechatronics Engineering II. 1eded.: Springer, Cham, 2022, v., p. 245-256. http://dx.doi.org/10.1007/978-3-031-09385-2_22
- [B01] **CERQUEIRA, C.S.**; KINER, C.; KIRNER, T. G. Using Augmented Reality Cognitive Artifacts in Education and Virtual Rehabilitation. Virtual Reality in Psychological, Medical and Pedagogical Applications. 1ed.Rijeka: InTech, 2012, p. 247-270. http://dx.doi.org/10.5772/46416

CONFERENCE PROCEEDINGS

- [C45] FIGUEIREIDO, F.L.; SZVATICSEK, M.S.; SILVA, M.A.P.; DANTAS, J.P.A.; **CERQUEIRA**, C.S.; Análise das Formaturas Operacionais no Combate Aéreo Além do Alcance Visual para Infiltração em Território Inimigo. Conference: Symposion on Operational Applications in Defense Areas. At: São José dos Campos. Volume: XXVII. https://www.researchgate.net/publication/395868278_Analise_das_Formaturas_Operacionais_no_Combate_Aereo_Alem_do_Alcance_Visual_para_Infiltracao_em_Territorio_Inimigo (Analysis of Operational Formations in Beyond Visual Range Air Combat for Infiltration into Enemy Territory)
- [C44] HUGO, A.; SILVA, J.C.; **CERQUEIRA**, C.S.; COUTINHO, O.L.; MACHADO, R.; COSTA, M.M.; System Engineering Process to Design a Low-Cost Ground Station for Defense Applications. Conference: Symposium on Operational Applications in Defense Areas. At: São José dos Campos. Volume: XXVII.

https://www.researchgate.net/publication/396871355_System_Engineering_Process_to_Design_a_Low-Cost_Ground_Station_for_Defense_Applications

- [C43] **CERQUEIRA, C.S.**; FULINDI, J. B.; BARBACOVI, L. O.; PLEFFKEN, D. R. "CONCEPT.IO: Open-source Arena for Academic CONOPs Experimentation of Robotics, Models and Digital Twins." In 10th North American Conference on Industrial Engineering and Operations Management. 2025, https://doi.org/10.46254/NA10.20250217.

- [C42] FALQUETO, L. E. and **CERQUEIRA, C. S.** "Designing and Optimizing Autonomous Delivery Systems through MBSE and Discrete-Event Simulation." In 10th North American Conference on Industrial Engineering and Operations Management. 2025, https://doi.org/10.46254/NA10.20250221.

- [C41] BARBOSA, L. M.; OLIVEIRA, I. C. A.; **CERQUEIRA, C. S.**; DA CUNHA, A. E. C. Mean dependency length? a new metric for requirements quality. In: INCOSE International Symposium, 2024, Dublin. INCOSE International Symposium: Volume 34, Issue 1. San Diego: INCOSE, 2024. v. 41.

- [C40] MOREIRA, G. M. B. ; PLEFFKEN, D. R.; **CERQUEIRA, C.S.;** SANTOS, W. G. . Enhancing Brazilian Aerospace Systems Lifecycle Directive. In: SIGE, 2024, São José dos Campos. XXVI Simpósio de Aplicações Operacionais, 2024.

- [C39] CUNHA, R. C.; **CERQUEIRA, C.S.;** Uma Proposta de Padrões de Sintaxe de Requisitos no Idioma Português. In: Workshop on Requirements Engineering, 2023, Porto Alegre. Anais do Workshop em Engenharia de Requisitos. Recife: Even3, 2023. http://dx.doi.org/10.29327/1298356.26-23 (A Proposal for Requirements Syntax Standards in the Portuguese Language)

- [C38] PLEFFKEN, D. R.; CARDOZO JR, M. M; CORDEIRO, R. M.; FREITAS, A. C. S.; HAMASAKI, P. ; **CERQUEIRA, C. S**. Risk Analysis for In-Flight Refueling Missions Between a Jet-Powered Aircraft and Helicopters. In: 33rd European Safety and Reliability Conference, 2023. Proceeding of the 33rd European Safety and Reliability Conference. Singapore: Research Publishing Services, 2023. p. 178. (http://dx.doi.org/10.3850/978-981-18-8071-1_P240-cd)

- [C37] PLEFFKEN, D. R.; BOURGUIGNON, V. O.; MOREIRA, G. M. B.; **CERQUEIRA, C. S.** Acceptance of Residual Risk in Brazilian Military Aeronautical Design through Methodology Application. In: 33rd European Safety and Reliability Conference, 2023. Proceeding of the 33rd European Safety and Reliability Conference. Singapore: Research Publishing Services, 2023. p. 128. (http://dx.doi.org/10.3850/978-981-18-8071-1_P049-cd)

- [C36] PLEFFKEN, D. R.; **CERQUEIRA, C. S.**; SOARES, C. R. P. Strategic Planning Development for the Inclusion of Individuals with Autism using Value Focused Thinking Method for Future Urban Mobility. In: LV Simpósio Brasileiro de Pesquisa Operacional, 2023, São José dos Campos. Anais do LV SBPO, 2023.

- [C35] COGO, M. V. C.; MUENCHEN, C. D.; LIMA, J. S.; Villani, E.; **CERQUEIRA, C. S.** Inconsistency Detection Methods for Statecharts and Sequence Diagrams: A Systematic Literature Review. In: Simpósio de Aplicações Operacionais em Áreas de Defesa, 2023,

São José dos Campos. Anais do Simpósio de Aplicações Operacionais em Áreas de Defesa. São José dos Campos: ITA, 2023. p. 132-133.

- [C34] PLEFFKEN, D. R.; **CERQUEIRA, C. S.**; MOREIRA, G. M. B.; CLARINDO, D. Enhancing Spaceworthiness Process Based on Certification Procedures Applied in KC-390 and Gripen F-39. In: XXV Simpósio de Aplicações Operacionais em Áreas de Defesa (SIGE), 2023, São José dos Campos. Proceeding do XXV Simpósio de Aplicações Operacionais em Áreas de Defesa (SIGE), 2023.
- [C33] PLEFFKEN, D. R.; MAXIMILIANNO, M. B. M.; **CERQUEIRA, C. S**. A Necessidade de Padronização de Modelos de Maturidade em Projetos Aeroespaciais Brasileiros. In: XV Encontro Acadêmico de Propriedade Intelectual, Inovação e Desenvolvimento, 2023, Rio de Janeiro. XV Encontro Acadêmico de Propriedade Intelectual, Inovação e Desenvolvimento, 2023. (The Need for Standardization of Maturity Models in Brazilian Aerospace Projects)
- [C32] MOREIRA, G.; PLEFFKEN, D. R.; **CERQUEIRA, C. S.**; SANTOS, W. G. STPA Analysis over the Earlier Phases of Brazilian Aerospace Products Life Cycle Using OPM. In: 2022 13th International Conference on Mechanical and Aerospace Engineering (ICMAE), 2022, Bratislava. 2022 13th International Conference on Mechanical and Aerospace Engineering (ICMAE). Bratislava, 2022. p. 465-471. http://dx.doi.org/10.1109/icmae56000.2022.9852838
- [C31] OLIVEIRA, C. E. S. A.; SANTOS, W. G.; **CERQUEIRA, C. S.;** KUKULKA, P. A. Development of a Conceptual Architecture for a Space Situational Awareness (SSA) System using Model-Based Systems Engineering Approach. In: 3rd IAA Conference on Space Situational Awareness (ICSSA), 2022, Madrid. Proceedings of the 3rd ICSSA, 2022.
- [C30] DONATI, D. C. X.; KOPKO, L.; BORGES, N. K.; BERNARDES, P. V. T.; POSSAMAI, T. S.; **CERQUEIRA, C. S.;** CONTO, A. M. Mission Design of Catarina Constellation's Fleet: A Systems Engineering Case Study. In: IAA-LA CubeSat Workshop & IAA-LA Symposium on Small Satellites, 2022, Brasília. Proceedings of the 3rd IAA Conference on University Satellite Mission and Cubesat Workshop, 2022.
- [C29] AZEVEDO, J. G.; **CERQUEIRA, C. S.**; COSTA, L. E. V. L.; SATO, L. H. S. Processo Sistêmico de Verificação e Validação do ADCS do CubeSat SPORT. In: SIGE 2022, 2022, São José dos Campos. Anais do SIGE 2022, 2022. (CubeSat SPORT ADCS Systemic Verification and Validation Process)
- [C28] MUENCHEN, C. D.; **CERQUEIRA, C. S.** Using Model Based Systems Engineering to Create a Triple Channel Cognitive Concept of Operations. In: SIGE 2022, 2022, São José dos Campos. Anais do SIGE 2022, 2022.
- [C27] PLEFFKEN, D. R.; **CERQUEIRA, C. S.** Aplicando Engenharia de Sistema Baseada em Modelos para suportar Projetos Aeroespaciais Militares no Brasil. In: XXIV Simpósio de Aplicações Operacionais em Áreas de Defesa (SIGE), 2022, São José dos Campos. Proceedings of the XXIV Simpósio de Aplicações Operacionais em Áreas de Defesa (SIGE), 2022. (Applying Model-Based System Engineering to support Military Aerospace Projects in Brazil)

- [C26] CUSTÓDIO, S. S. D.; **CERQUEIRA, C. S.** Aprendizagem por Projetos no Ensino de Engenharia Aeroespacial e Aeronáutica. In: Congresso Brasileiro de Educação em Engenharia, 2021. ANAIS do XLIX Congresso Brasileiro de Educação em Engenharia, 2021. http://dx.doi.org/10.37702/cobenge.2021.3595 (Project Learning in Aerospace and Aeronautical Engineering Teaching)
- [C25] CUSTÓDIO, S. S. D.; **CERQUEIRA, C. S.** Educação Empreendedora: Um Estudo de Caso no Curso de Engenharia Aeroespacial. In: 13º Congresso Brasileiro de Inovação e Gestão de Desenvolvimento de Produto, 2021, São Paulo. Blucher Engineering Proceedings. São Paulo: Blucher, 2021. p. 1034. http://dx.doi.org/10.5151/cbgdp2021-3125 (Entrepreneurial Education: A Case Study in the Aerospace Engineering Course)
- [C24] SILVA, R. S. C.; SANTOS, W. G.; **CERQUEIRA, C. S.** International and Brazilian Air Force's requirement definition processes for space systems. In: Simpósio de Aplicações Operacionais em Área de Defesa, 2021, São José dos Campos. Anais do SIGE 2021. São José dos Campos, 2021.
- [C23] MOREIRA, G.; LIMONGE, W.; LAHOZ, C. H. N.; **CERQUEIRA, C. S.**; SANTOS, W. G. STPA Analysis over the Earlier Phases of Military Products Life cycle. In: SIGE - Simpósio de Aplicações Operacionais em Área de Defesa, 2021, São José dos Campos. Anais do SIGE 2021, 2021.
- [C22] COSTA, M. M. S.; SANTOS, W. G.; FULINDI, J. B.; **CERQUEIRA, C. S.**; KUKULKA, P. A.; COSTA, L. E. V. L. On the use of Synthetic Aperture Radar sensors for Venus exploration. In: XX Colóquio Brasileiro de Dinâmica Orbital, 2021, São Bernardo do Campos. Anais do XX Colóquio Brasileiro de Dinâmica Orbital, 2021.
- [C21] COSTA, L. E. V. L. ; KUKULKA, P. A. ; **CERQUEIRA, C. S**. ; FULINDI, J. B. ; SANTOS, W. G. ; SATO, L. H. S. ; JERONYMO, A. C. I. ; MENEZES, R. G. S. ; CRUCIOLI, B. A. ; PAULA, L. S. ; PIMENTEL, R. ; CABRAL, P. L. ; MOREIRA, H. J. P. ; AZEVEDO, J. G. ; HSIAO, E. ; WOTTRICH, R. G. ; PEREIRA, M. O. ; OGAWA, M. A. ; OLIVEIRA, E. H. S. ; VIEIRA, D. G. ; et.al . The ITA Space Center and Its Role in Space Education in Brazil. In: Small Satellite Conference, 2020, Logan. Proceedings of the Small Satellite Conference. Logan, 2020.
- [C20] LIMA, J. S.; BURGUER, E. E.; CAMARGO, L.; Rodrigues, I. P.; NONO, D. A.; PEREIRA, M. O.; TIKAMI, A.; SANTOS, W. A.; **CERQUEIRA, C. S.**; MOREIRA, H. J. P.; TAVARES, F. O.; TENORIO, P. I. G.; ASENCIO, J. C. R. CTEE - An Approach for Developing Space Engineering Practices with Nanosatellites in Brazil. In: III IAA Latin American CubeSat Workshop, 2018, Ubatuba. IAA Proceedings Book Series, 2018.
- [C19] SANTOS, W. A.; ASENCIO, J. C. R.; BURGUER, E. E.; CAMARGO, L. ; CERQUEIRA, C. S. ; LIMA, J. S. ; MOREIRA, H. J. P.; NONO, D. A.; PEREIRA, M. O. ; Rodrigues, I. P. ; TAVARES, F. O. ; TIKAMI, A. ; TENORIO, P. I. G. CubeDesign: A Comprehensive Competition for Space Engineering Capacity Building in Latin America. In: III IAA Latin American CubeSat Workshop, 2018, Ubatuba. IAA PROCEEDINGS SERIES BOOK, 2018.
- [C18] CAMARGO, L.; ASENCIO, J. C. R.; BURGUER, E. E.; **CERQUEIRA, C. S.;** LIMA, J. S.; MOREIRA, H. J. P.; NONO, D. A.; PEREIRA, M. O.; Rodrigues, I. P.; TAVARES, F.

OO.; TIKAMI, A.; TENORIO, P. I. GG.; SANTOS, W. A. Experimenting with NanoSATs and PicoSATs for Capacity Building in Brazil. In: III IAA Latin American CubeSat Workshop, 2018, Ubatuba. IAA PROCEEDINGS SERIES BOOK, 2018.

- [C17] Rodrigues, I. P.; SANTOS, B. P.; MATUBARA, F. K.; OLIVEIRA, G. R. A.; OLIVEIRA, R. E. L.; MARTINS, V. B.; **CERQUEIRA, C. S.**; AMBROSIO, A. M. Modelagem e simulação em apoio às atividades de verificação e validação: uma experiência no Curso de Inverno do INPE. In: 9º Workshop em Engenharia e Tecnologia Espaciais, 2018, São José dos Campos. Anais do 9º Workshop em Engenharia e Tecnologia Espaciais. São José dos Campos: INPE, 2018. (Modeling and simulation in support of verification and validation activities: an experience in the INPE Winter Course)

- [C16] **CERQUEIRA, C. S.**; AMBROSIO, A. M.; KIRNER, C. Using ISO-19450 to Describe and Simulate a SmallSat Operational Scenario. In: 8º Workshop em Engenharia e Tecnologia Espaciais, 2017, São José dos Campos. Anais do 8º Workshop em Engenharia e Tecnologia Espaciais. São José dos Campos: INPE, 2017.

- [C15] JESUS, G. T.; **CERQUEIRA, C. S.**; LIMA, J. S.; DINIZ, G. Gerenciamento de riscos na fase inicial de uma missão espacial de iniciativa educacional e tecnológica. In: 8º Workshop em Engenharia e Tecnologia Espaciais, 2017. Anais do 8º Workshop em Engenharia e Tecnologia Espaciais, 2017. (Risk management in the initial phase of a space mission of educational and technological initiative.)

- [C14] **CERQUEIRA, C. S.**; SANTOS, O. F.; GEUS, I.; BARROS, L. S. L.; AMBROSIO, A. M. Descrição do comportamento de modelos para um Simulador Operacional de Satélites em OPM. In: 8º Workshop em Engenharia e Tecnologia Espaciais, 2017, São José dos Campos. Anais do 8º Workshop em Engenharia e Tecnologia Espaciais. São José dos Campos: INPE, 2017. (Description of model behavior for an OPM Satellite Operational Simulator.)

- [C13] BURGUER, E. E.; LOUREIRO, G.; MARINO, G. G. C.; **CERQUEIRA, C. S.** Definição da missão do CubeSat Alfa. In: 8º Workshop em Engenharia e Tecnologia Espaciais, 2017, São José dos Campos. Anais do 8º Workshop em Engenharia e Tecnologia Espaciais. São José dos Campos: INPE, 2017. (Definition of the CubeSat Alfa mission)

- [C12] Rodrigues, I. P.; GOES, R.; **CERQUEIRA, C. S.**; AMBROSIO, A. M. Data Collection Subsystem Modelling and Simulation using Simulink. In: 8º Workshop em Engenharia e Tecnologia Espaciais, 2017, São José dos Campos. Anais do 8º Workshop em Engenharia e Tecnologia Espaciais. São José dos Campos: INPE, 2017.

- [C11] Rodrigues, I. P.; AMBROSIO, A. M.; **CERQUEIRA, C. S.** Towards an Automated Hybrid Test and Simulation Framework to Functional Verification of Nanosatellites' Electrical Power Supply Subsystem. In: II IAA Latin American CubeSat Workshop, 2016, Florianópolis. Proceedings of II IAA Latin American CubeSat Workshop, 2016.

- [C10] Rodrigues, I. P.; AMBROSIO, A. M.; **CERQUEIRA, C. S.** A Framework for Automated Model Validation Applied to Picosatellite Electrical Power Subsystem. In: 7º Workshop em Engenharia e Tecnologia Espaciais, 2016, São José dos Campos. Anais

do 8º Workshop em Engenharia e Tecnologia Espaciais7. São José dos Campos: INPE, 2016.

- [C09] **CERQUEIRA, C. S.**; Barbosa, P. D.; Rodrigues, I. P.; Villani, E. Two Independent Processes of Verification Applied to a Satellite Simulator. In: 7º Workshop em Engenharia e Tecnologia Espaciais, 2016, São José dos Campos. Anais do 7º Workshop em Engenharia e Tecnologia Espaciais. São José dos Campos: INPE, 2016.

- [C08] **CERQUEIRA, C. S.;** AMBROSIO, A. M.; KIRNER, C.. A Model Based Concurrent Engineering Framework using ISO-19450 Standard. In: 7th International Conference on Systems & Concurrent Engineering for Space Applications, 2016, Madrid. Proceedings of 7th International Conference on Systems & Concurrent Engineering for Space Applications, 2016.

- [C07] YASSUDA, I. S.; OLIVEIRA, M. E. R.; LOPES, I. M. L.; MORAIS, M. H. E.; GONDO, S. M. H.; OLIVEIRA JUNIOR, E. M.; **CERQUEIRA, C. S.**; NONO, M. C. Creating and maintaining a workshop for graduate course in space engineering and technology and its usefulness to the training of future researchers. In: International Symposium on Space Technology and Science, 2015, Osaka. Proceedings of 30th International Symposium on Space Technology and Science, 2015.

- [C06] **CERQUEIRA, C. S.**; AMBROSIO, A. M.; KIRNER, C.; Souza, F. L. Structuring a Cross-Reality Environment to support a Concurrent Engineering Process for Space Mission Concept. In: 6th International Conference on Systems & Concurrent Engineering for Space Applications, 2014, Stuttgart. Proceedings of 6th International Conference on Systems & Concurrent Engineering for Space Applications, 2014.

- [C05] **CERQUEIRA, C. S.**; SANTOS, W. A.; AMBROSIO, A. M.. Serious Game Interaction Techniques Applied to an Operational Satellite Simulator. In: XII Simpósio Brasileiro de Jogos e Entretenimento Digital, 2013, São Paulo. Anais do XII Simpósio Brasileiro de Jogos e Entretenimento Digital, 2013. p. 437-445.

- [C04] TOMINAGA, J.; **CERQUEIRA, C. S.**; KONO, J.; AMBROSIO, A. M. Specifying Satellite Behavior for an Operational Simulator. In: Simulation and EGSE facilities for Space Programmes Workshop (SESP 2012), 2012, Noordwijk. Proceedings of the Simulation and EGSE facilities for Space Programmes Workshop, 2012.

- [C03] KIRNER, C.; **CERQUEIRA, C. S.**; KIRNER, T. G.. Dynamic spatial positioning system based on sounds and augmented reality for visually impaired people. In: The Ninth International Conference on Disability, Virtual Reality and Associated Technologies, 2012. Proceedings of The Ninth International Conference on Disability, Virtual Reality and Associated Technologies, 2012.

- [C02] **CERQUEIRA, C. S**.; KIRNER, C. Developing Educational Applications with a Non-Programming Augmented Reality Authoring Tool. In: World Conference on Educational Multimedia, Hypermedia and Telecommunications (EDMEDIA), 2012, 2012, Denver, Colorado, USA. Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2012, 2012. v. 2012. p. 2816-2825.

- [C01] KIRNER, C; **CERQUEIRA, C. S.**; FLAUZINO, F.; KIRNER, T. G. Design of a Cognitive Artifact based on Augmented Reality to Support Multiple Learning Approaches.

In: World Conference on Educational Multimedia, Hypermedia and Telecommunications (EDMEDIA), 2012, 2012, Denver, Colorado, USA. Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications, 2012. v. 2012. p. 2834-2843.

AWARD/HONORS

- 2024 - Certificate of gratitude from the General Staff of Aeronautics for the Extension Course in Systems Engineering and Requirements and its contributions to the project activities of the General Staff, given by the Maj Brig Ar Valter Borges Malta (Vice-head of the General Staff)
- 2023 - Certificate of Heartfelt Appreciation for outstanding contributions as Academic Subcommittee for the SSP23 (Space Studies Program 2023).
- 2023 - Alumni choice of Honored Professor of the Class of 2023 of the Specialization Course in Space Operations.
- 2023 - Alumni choice of Honored Professor of the Class of 2023 of the Aerospace Engineering Program.
- 2022 - Alumni choice of Honored Professor of the Class of 2022 of the Aerospace Engineering Program.
- 2022 - Course Recognition of Excellence in Teaching Systems Engineering at the 1st Week of Operational Applications
- 2021 - Alumni choice of Praise in teaching as a professor of the SIS-20 (Ground Systems) and SIS-08 (Verification and Quality) Courses.
- 2020 - Alumni choice of Honored Professor of the Class of 2020 of the Aerospace Engineering Program.

GRANTS/FUNDING

Instituto Tecnológico de Aeronáutica - ITA (Aeronautics Institute of Technology)

Center for the Development of Critical Technologies for the Air Domain of the Future:

- Role: Vice-head and PI of two projects under this umbrella funding.
- Received Grants in the order of $4.600.577,83 dollars
- Due the role of implementation of the center, share of around: $1.369.230
- Due the role of PI, share of around: $553.846,00
- 2024-2027 (ended my participation as Vice-PI and Project PIs in August)

Modular VLEO (Very Low Earth Orbits) Platform for Responsive Operations.

- Role: PI
- Received Grants in the order of $95.011,56
- 2023-2025 (Ends in December)

Air Domain Study - Virtual Demonstrator.

- Role: Former Brazilian-side Academic PI and currently External Academic Supervisor
- Received grants in the order of $714.285,71
- 2022-2026 (Ends in March)

Air Domain Study - SIMUA (Safe Integration of different Manned and Unmanned Aircrafts into non-segregated air space)

- Role: Brazilian-side Academic PI and currently External Academic Supervisor
- Received grants in the order of $350.000,00
- 2022-2026 (Ends in March)

Expansion of the ITA Space Center. Responsible for the organization of the grant to the professors, and preparation/legal documentation to start the process.

- Role: Administrative Management, started in 2022 and ended in 2024.
- Received Air Force grants in the order of $386.448,54 to the building expansion.
- Received Government grants in the order of $920.115,57 to acquisition of a X/S Band Satellite Antenna.
- 2022-2023

MENTORSHIP

Doctorates:

On-going:

- Alexandre Macedo de Oliveira - Multidisciplinary Optimization Framework to Concurrent Design Facilities for Rocket Design (AEB)
- Leonan Stringer Falqueto - Multidisciplinary Optimization Framework for Multi Domain Operations (FAB)
- Alex Sandro Mendes Tostes - Design of UTM/UAM KPIs (FAB)
- Linélcio dos Santos Paula - Early Risk Systems Thinking Methodology (EMBRAER)
- Emerson Henrique Silva de Oliveira - CONOPs Validation on the beginning of the lifecycle (ORBITAL)
- Renato Henrique Ferreira Branco - Design of a Model Based Program Management Framework (INPE)
- Luciano Tomassoni - Regulatory Analysis using MBSE of Rocket Launching Centers (FAB)

2025

- [D04] Pleffken, Daniel Rondon - A model-based traceability process for aerospace certification
- [D03] Moreira, Guilherme Micheli Bedine - Use of Large Language Models to Support Aerospace Defense Systems Engineering

2024

- [D02] Barros, Priscila Renata Silva - Multi-methodology for Eliciting Stakeholder Needs in the Initial Phases of Systems Engineering. - This work was from the Brazilian Institute for Space Research
- [D01] Barbosa, Leonardo de Melo - Natural Language Structuring for Documentation of System Requirements and Military Employment Materials in the Portuguese Language. - This work was from the Army's Engineering Military Institute.

Masters:

On going:

- Matheus Vieira Carmona Cogo - Architecture Validation using SysML Diagrams (Boeing)
- Guilherme Arantes - Development of a Safety Analysis Framework using Capella Models (Boeing)
- Ariane de Novais Bezerra Rodrigues - Study of Human-Machine Interfaces for Multi-domain Situational Awareness (EMBRAER)
- Guilherme Matos de Oliveira - Systems Engineering Copilot to SysML V2 (EMBRAER)
- Camila J. Lau - MBSE Implementation in Urban Planning Problems (EMBRAER)
- Maria Leticia Rangel Fraga - Single Pilot Systemic Modeling and Analysis (EMBRAER)
- Luísa Cândia - Mapping market requirements and generating value solutions (EMBRAER)
- Mauricio Taffarel - Modeling of Small Radars to perform Detect and Avoid functions. (EMBRAER)
- Thiago Luís de Oliveira Xavier da Silva - Integrated Air Defense Framework in Model based Systems Engineering and Multi domain Simulation (FAB)
- Filipe de Paulo Oliveira - Systems Engineering and Cybersecurity applied to Critical Infrastructures (FAB)
- Francisco Henrique Figueiredo Araujo - Requirements for Simulation of Airspace Safety.
- Betina Luísa Lenhard - UTM Simulation Steering (Full-time Student)
- Marco Antônio Pacheco da Silva - Use of XR into creation of Multi-Domain Operation CONOPs. (Full-time Student)
- Pedro Henrique Blatt Machado - Use of LLM to help the process of creating SysML V2 Models (Full-time Student)
- Renato Bernardes Rodrigues - Use of Tangible Artifacts into creation of Multi-Domain Operations CONOPs (Full-time Student)

2025

- [M09] Raphael Machado Cezar - UAF Study into Enterprise Systemic Modeling of eVTOL Enterprises

2024

- [M08] Coelho, Rebeca Camurça - An Approach Combining MBSE and Requirement Syntax Standards in Portuguese applied to the Development of Complex Systems.
- [M07] Oliveira, Bruno Avelino de Araujo - A Hybrid Airspace Modeling for using Drones in Logistics Operations
- [M06] Melo, Thiago Silva - Application of Cyber Threat Framework in the Decomposition of Satellite Ground Segment Functions.

2023

- [M05] de Azevedo, Jéssica Garcia - Model-Based Systems Engineering to Support the Verification Process of a CubeSAT Attitude Determination and Control Subsystem
- [M04] Muenchen, Carline Degregori - MBSE and Parametric Analysis applied to Microgravity Experimentation Systems - This work was funded by the Orbital Company.

2022

- [M03] de Souza, Ygor Logullo, - A Participatory Process to Loyalty FAB Mission Models and Simulations to your Demands.

2021

- [M02] da Silva, Raquel Silveira Cordeiro - System and Requirements Definition Process for the Life Cycle of Space Systems at Brazilian Air Force
- [M01] de Oliveira, Rômulo Vieira - Conceptual Model of Joint Force Conception

Military Specialization Courses

2025

Specialization Course in Analysis and Selection of Weapons Systems

- [S10] Miranda, Felippe - Exploration of Air Defense Scenarios for UAV-based attacks

2024

Specialization Course on Space Systems Operations

- [S09] Borges, Raphael Lopes - Design, comparison and proposals for improvements of the Operational Safety Doctrine of LEO satellites operated by COPE.
- [S08] Soares, Marcos Vinicio da Silva - Study of the Temporal Evolution of Standard Deviations of Parameters and Variables, with Deviations from Disturbances in a Helium-Synchronous Reference Trajectory.

Specialization Course on Operational Research

- [S07] Simões, Diogo Landim - Analysis of the Characteristics and Capabilities of the Defense Technologies against the Shahed-136 Drone and its Applicability in the Brazilian Context.

- [S06] Dutra, Igor de Padua - Analysis of the use of Fixed-Wing Aircraft in the First Six Months of the Conflict Between Russia and Ukraine.

2023

Specialization Course on Space Systems Operations

- [S05] Gotelip, Matheus Rodrigues - Design of Multi-domain Operations involving Satellite Assets
- [S04] da Silva, Lucas Gonçalves - Responsive Satellite use in ISR Missions
- [S03] Carmo, Felipe Mostavenco - Study and Simulation of operations of low orbit communication constellations.
- [S02] da Silva, Carlos Eduardo Xavier - Structuring the problem of accreditation of space project organizations in the IFI.

2022

Specialization Course on Operational Research

- [S01] Leitão, Ricardo Camacho - Exploratory Research on the Processes of Developing Operational Doctrine within the Brazilian Air Force, the American Armed Forces and the United Kingdom

Undergraduate Capstone Mentorships

2025 (on-going - all ends in November)

- Bruna Belarmino Silva UTM Simulation
- Eduardo Moura Zindani - Orbit Simulation and Launch with Artificial Intelligence and Augmented Reality Visualization
- Gabriel Firme Rodrigues - City Economics Modeling and Simulation
- João Paulo Machado Coelho Penna - Simulation of the dynamics of the use of drones in urban deliveries: a comparative analysis with conventional deliveries by motorcycle
- Marcus Gabriel de Almeida Nunes - Development of a Plugin for Simulation Analysis and Monitoring in Arena Concept.IO
- Marlon Wendrer Jacinto - Construction of a Metaverse Integrated with Digital Twins with Physical Sensors
- Lucas Balen Cardozo - Modeling and Simulation of the Operation of PESE Space Systems
- Veronica Rodriguero - Modeling of a VTOL Airline for Urban Transport in the city of São Paulo

2024

- [U28] Diaconiuc, Guilherme - Creation of 3D scenarios based on photogrammetry by drones for use in simulation environments
- [U27] de Freitas, Phellype Rerison Figueiredo - Modeling of RPASs (Remotely Piloted Aircraft Systems) in a Virtual Reality environment

- [U26] Gomes, Isabela Matos - Optimization of drone routes using reinforcement learning
- [U25] de Andrade, David Victor - Development of accessible interfaces in virtual reality environments for secure integration simulations of FAB aircraft
- [U24] Sailer, Leonardo Vásques - Digital twin modeling of aerial employment resources in a simulation environment
- [U23] Guimarães, André Felipe Pereira - Methodology for implementation of dynamic redirection system in BR-UTM
- [U22] e Silva Britto, Eduardo Soares - Integration of drone swarm simulator into a world simulator using the MQTT protocol

2023

- [U21] de Carvalho Noronha, Ana Clara - Technology transfer in compensation agreements: opportunities in the academic environment
- [U20] de Souza Ramos, Lúcio Martins - Systemic project of training rocket with liquid propulsion for the Alcantara Launch Center
- [U19] Biciati, Vítor Batista - Modeling and simulation of aerospace missions in virtual reality environments
- [U18] Godinho, Matheus Martins; de Melo Thiessen, Daniel Luiz - Structuring of ITA Space Center digital twins for metaverse creation with cross reality
- [U17] Meisler, Gabriel - Evaluation of unsupervised deep domain adaptation performance for UAV power line detection in urban areas - Won Honorable Mention and Boeing best capstone project of the year.
- [U16] de Araujo Filho, Luciano Jacob - Advantages and technological challenges for the feasibility of a space elevator

2022

- [U15] Frageri, Daniel Martins - Generation and analysis of future scenarios for the mining of asteroids with high presence of platinum group materials (PGE's)
- [U14] Pinheiro, Leonardo Mouta Pereira - Manipulating a cable-suspended object with multiple UAVs and environment contacts in 2D
- [U13] e Azevedo, Rafael Purim - Metrics analysis for systemic simulation validation
- [U12] dos Anjos Godinho, Israel - Structuring of the operating concept of an observation nanosatellite applied to fighting forest fires based on ANSI/AIAA G-043B-2018
- [U11] Constante, Matheus Uchôa - Development of methodology to generate visibility windows in the context of planning and programming of satellite operations
- [U10] de Sá Amaral Oliveira, Carlos Eduardo - Conceptual project of a space surveillance and tracking system (SST) : a case study for the ITA space center
- [U09] Aguiar, Rubens Miguel Gomes - Adding simulation capability to systemic models

2021

- [U08] Quintino, Geune Vieira - Coupling of fault tree analysis in a systemic architecture

- [U07] Alves, Lucas Lenzi - Transformation of systemic models to discrete simulation
- [U06] da Silva Henriques, Walter Diniz - Structuring the conceptual architecture of a hypersonic vehicle using model-based systems engineering
- [U05] Ferreira, Yuri Dias - Model-based systems engineering (MBSE) applied to IFFM4BR project adapter
- [U04] Facchin, Rafael Bruno Cardoso - Preliminary feasibility analysis of a Brazilian nano-launcher vehicle
- [U03] e Souza, Pedro Elardenberg Sousa - Structuring of a distributed simulation architecture for aerospace systems

2020

- [U02] Lisboa, Fernando Oliveira; Lima, Lorenzo Pellizzaro - SMAD-Capella framework proposal using Cubesat Raincube as a case study

2019

- [U01] Saboia, Filipe José Oliveira - Stakeholder Categorization and Analysis Applied to an Aerospace Mission

SERVICE

Instituto Tecnológico de Aeronáutica - ITA (Aeronautics Institute of Technology)
2018-2025

Head of the implementation of the ITA's Innovation Center - 2025-2025

- Responsible for the structure of the board of directors of the Innovation Center.
- Responsible for the definition of the layout of the labs to research the Air Domain operations of the future - related to the partnership with Sweden.

Contract reviewer of ITA's funded projects. 2024-2025

Head of the implementation of the Systems Engineering Program - 2023-2025

- Responsible for the pedagogical program of the undergraduate course and research lines of the graduate course.
- Responsible for writing the professor positions for professor hiring process.
- Responsible for the design of the educational laboratory's setup.

Implementation and Expansion of the ITA Space Center - 2019-2024

- Vice-head of the implementation of the first phase of the ITA Space Center, responsible for the facility layout and construction site tracking - 2019-2020.
- Head of the expansion project of the ITA Space Center, responsible for the organization of the grant, preparation of the documentation and structure of the initial new facility layout - 2022-2024.

- Responsible for the starting of the acquisition process of a X/S-Band Satellite Antenna from SAFRAN, to be installed on campus - 2022-2024.

Admission Test:

- Test application in 2019, 2020, and 2021
- Head of the admission testing committee in 2022 and 2023.

On-demand project reviewer

- Air Force Project Reviewer: requirements and architectures of the major Air Force projects, contributing with improvements of Technical Requirements elicitation process.
- Brazilian Space Agency Reviewer: lifecycle reviewer of Brazilian Space Agency funded projects, specially into the first phases to organize the concept maturity level of the projects.

TEACHING EXPERIENCE

Embry-Riddle Aeronautical University- ERAU
2025-now

Total of 96 hours. **

Fall 2025

Title	Hours	Students
Instructor of Record: SYS-610 – System Architecture Design and Modeling ** ongoing – Graduation 15th December	48	12 students - Graduate Level
Instructor of Record: SYS-530 – System Requirements Analysis and Modeling ** ongoing – Graduation 15th December	48	36 students - Graduate Level

Instituto Tecnológico de Aeronáutica - ITA (Aeronautics Institute of Technology)
2018-now

Total of 1648 hours.

Fall 2025

Title	Hours	Students
Instructor of Record: TE-265 - Model Based Systems Engineering ** ongoing – Graduation 15th December	48	69 students - Graduate Level

Spring 2025

Title	Hours	Students
Instructor of Record: AS-761 - Model based Systems Engineering	28	50 students - Graduate level of EMBRAER's Professional Master Program
Instructor of Record: SIS-04 – Systems Engineering	22	22 students - Undergraduate Level
In-company extension course on Model based Systems Engineering at EMBRAER ** ongoing – Graduation 24th/October	100	40 students - Graduate Level
Instructor of Record: SIS-08 - Verification and Quality of Aerospace Systems	48	30 students - Undergraduate Level
Extension course on Model based Systems Engineering to ICEA (Instituto de Controle do Espaço Aéreo – Aerospace Control Institute)	40	12 students - Graduate Level

Fall 2024

Title	Hours	Students
Instructor of Record: ASP-61 - Environment and sustainability in Aerospace Sector	48	23 students - Undergraduate Level + 6 Military Officer Level
Instructor of Record: TE-265 - Model Based Systems Engineering	48	23 students - Graduate Level
In-company extension course on Model based Systems Engineering at EMBRAER	100	40 students - Graduate Level

Spring 2024

Title	Hours	Students
Instructor of Record: SIS-08 - Verification and Quality of Aerospace Systems	48	26 students - Undergraduate Level
Instructor of Record: SIS-04 – Systems Engineering	48	22 students - Undergraduate Level
Instructor of Record: AS-761 - Model based Systems Engineering	28	43 students - Graduate level of EMBRAER's Professional Master Program

Title	Hours	Students
Instructor of Record: SIS-20 - Aerospace Ground Segment Systems	48	5 Military Officer Level
Extension Course on Systems Engineering and Requirement Engineering given to High Rank Air Force Personnel	80	40 students - Graduate level

Fall 2023

Title	Hours	Students
Instructor of Record: PRJ-32 - Project and Construction of Aerospace Systems	48	6 students – Military Officer Level
Instructor of Record: ASP-61 - Environment and sustainability in Aerospace Sector	48	23 students - Undergraduate Level + 6 Military Officer Level
Instructor of Record: SIS-73 - Conceptual Project of Aerospace Systems	80	23 students - Graduate Level + 6 Military Officer Level
Instructor of Record: SIS-20 - Aerospace Ground Segment Systems	48	23 students - Graduate Level + 6 Military Officer Level

Spring 2023

Title	Hours	Students
Instructor of Record: TE-265 - Model Based Systems Engineering	48	23 students - Graduate Level
Instructor of Record: SIS-08 - Verification and Quality of Aerospace Systems	48	22 students - Undergraduate Level
Extension Course on Systems Engineering and Requirement Engineering given to High Rank Air Force Personnel	80	40 students - Graduate level

Fall 2022

Title	Hours	Students
Instructor of Record: SIS-20 - Aerospace Ground Segment Systems	48	25 students - Undergraduate Level
Instructor of Record: TE-219 - Concurrent Engineering	48	28 students - Graduate Level

Spring 2022

Title	Hours	Students
Instructor of Record: SIS-08 - Verification and Quality of Aerospace Systems	48	21 students - Undergraduate Level
Instructor of Record: PRJ-32 - Project and Construction of Aerospace Systems	48	22 students - Undergraduate Level
Instructor of Record: TE-265 - Model Based Systems Engineering	48	23 students - Graduate Level

Fall 2021

Title	Hours	Students
Instructor of Record: SIS-20 - Aerospace Ground Segment Systems	48	14 students - Undergraduate Level
Instructor of Record: TE-219 - Concurrent Engineering	48	13 students - Graduate Level
Instructor of Record: TE-265 - Model Based Systems Engineering	48	23 students - Graduate Level

Spring 2021

Title	Hours	Students
Instructor of Record: SIS-08 - Verification and Quality of Aerospace Systems	48	17 students - Undergraduate Level
Instructor of Record: PRJ-32 - Project and Construction of Aerospace Systems	48	21 students - Undergraduate Level

Fall 2020

Title	Hours	Students
Instructor of Record: SIS-20 - Aerospace Ground Segment Systems	48	18 students - Undergraduate Level

Spring 2020

Title	Hours	Students
Instructor of Record: SIS-08 - Verification and Quality of Aerospace Systems	48	16 students - Undergraduate Level
Instructor of Record: PRJ-32 - Project and Construction of Aerospace Systems	48	19 students - Undergraduate Level

Spring 2019

Title	Hours	Students
Instructor of Record: SIS-08 - Verification and Quality of Aerospace Systems	48	17 students - Undergraduate Level
Instructor of Record: PRJ-32 - Project and Construction of Aerospace Systems	48	18 students - Undergraduate Level

Universidade Federal de Itajubá - UNIFEI (Federal University of Itajubá)
2012

Total of 208 hours.

Fall 2012

Title	Hours	Students
Instructor of Record: CCO-013 - Programming Fundamentals (C/C++)	96	48 students - Undergraduate Level
Instructor of Record: SIF-220 - Computer Organization and Architecture	64	45 students - Undergraduate Level
Instructor of Record: CCT-903 - Topics in Artificial Intelligence (VR and AR)	64	15 students - Undergraduate Level

WORK EXPERIENCE

Instituto Tecnológico de Aeronáutica - ITA (Aeronautics Institute of Technology)   2016-2025

Tenured Professor of Systems Engineering (2018-2025)

- Full-time Professor (Teaching, Research and Extension)
- Air Force Projects' Reviewer: reviewer of requirements and architectures of the major Air Force projects, contributing with improvements of Technical Requirements elicitation processes and into the lifecycle of materials and systems. [on demand]
- Brazilian Space Agency Projects' Reviewer: lifecycle reviewer of Brazilian Space Agency funded projects, specially into the first phases to organize the concept maturity level of the projects. [on demand]

Professor Apprenticeship (2016)

- Professor Assistant internship required by the PhD scholarship program. Was responsible for the practical experiences of designing a small rocket and its measurement payloads.

Instituto Nacional de Pesquisas Espaciais - INPE (Brazilian Institute for Space Research)
2012-2018

Administration Assistant

- Responsible for the Graduate Courses Portfolio Management and data collection to write the program annual assessment reports.
- Guiding Tours to Visiting Schools
- Responsible for the Jr/Sr school tours at the INPE's facilities related to Satellite Integration, Control Center, Space Weather and Meteorology prediction laboratories.

Universidade Federal de Itajubá - UNIFEI (Federal University of Itajubá)
2011-2012

Temporary Professor - (2012)

- Laboratory Assistant on C/C++ introduction; responsible for two courses regarding "Computer Architecture and Organization" and "Augmented and Virtual Reality".

Software Developer and Collaborating Researcher

- My Capstone Project received state grants and enable me work as Software Developer and Collaborating Researcher.
- Responsible for 4 undergraduate student progress conducting weekly work meetings.
- Responsible for the development in C++ of an Authoring Tool to introduce Augmented Reality to High School professors and Science Museums. (basAR – Behavioral Authoring System for Augmented Reality)

MECTRON (Brazilian Defense Company - currently is known as SIATT)
2008-2009

Junior Engineer

- Responsible for developing real-time software to the Amazonia Satellite data acquisition boards, and I was responsible for designing a FPGA to provide real-time bilevel and analog reading from sensors spread through the spacecraft.
- First contact with Systems Engineering, which was handled by my supervisors and from an in-company training provided by Prof. Robbert Halligan.

CWS (Brazilian Industrial-Automotive Company)   2003-2004

Junior Embedded Developer Apprenticeship

- Responsible for implementing a CAN-USB sniffer using Motorola microcontrollers to be used to testing on trucks CAN networks
- Obs.: This company funded my professional course capstone project, and they hired me as an apprenticeship and later as technician.

General Computer Assembly and Maintenance **1999-2010**

Free lance

- Responsible for assembling personal computers and providing home assistance regarding hardware and software maintenance for a small company that used to sell personal computers.

INVITED PRESENTATIONS

2025

Panel: Panel in 10th North American Conference on Industrial Engineering and Operations Management with the title of "Teaching Discrete-Event Simulation in Industrial Engineering: A Comparative Study of North and South American Approaches"

- Audience: IEOM Attendees
- 19 June 2025

Keynote Speaker: in 10th North American Conference on Industrial Engineering and Operations Management with the title of "Connecting the dots… on the journey to uncover the essence of abstraction".

- Audience: IEOM Attendees
- 19 June 2025

Panel: Implementation of the Brazilian UTM Ecosystem

- Audience: ATECH Innovation Forum
- 24 April 2025

Seminar: Systems Engineering Educational Panorama

- Audience: EMBRAER Practice Community
- 10 April 2025

2024

Seminar and Panel: Systemic View Tools Presentation and Panel of Key Tools and Disciplines for aerospace technologies.

- Audience: Brazil-Sweden Innovation Week
- 12 November 2024

Seminar: Use of Simulations for Study of Multidomain Operations

- Audience: Armed Forces
- 15 October 2024

2023

Seminar: Application and Benefits of Model-Based Systems Engineering to Subway Design

- Audience: São Paulo State Metro Company
- 07 December 2023

Seminar: Applications and Benefits of Model Based Systems Engineering on the Brazilian Particle Accelerator.

- Audience: CNPEM Systems Engineering Workshop
- 04 December 2023

Seminar: Employment of Systems Engineering on the Defense Acquisition Life Cycle.

- Audience: First Seminar of the Lifecycle Management of Defense Systems.
- 22 November 2023

Seminar: Use of Capella as Digital Twin to Perform Complex Systems Simulation

- Audience: Capella Days Annual Workshop
- 16 November 2023

Seminar: XR4MBSE and the impacts into Complex Systems Design Collaboration

- Audience: Aeronautics Session on the Aeronautics Innovation Week at Stockholm.
- 7 November 2023

Seminar: Safe Integration in UTM Airspace in the context of Unmanned Aircraft operation activities

- Audience: 5th Edition of the Regional Symposium of Unmanned Aircraft Systems
- 2 October 2023

Seminar: Air Domain Studies - Safe Integration and Systemic Simulations

- Audience: Symposium of Operational Operations in Defense
- 27 September 2023

Seminar: Applications and Benefits of Model Based Systems Engineering at the Aeronautical Sector

- Audience: EMBRAER's workshop on Systems Engineering
- 20 September 2023

Podcast: Host of the Podcast PdQSAT: Applications of MBSE into a university Project, with the participation of the Maria Letícia Fraga and Bruna Queiroz, both from EMBRAER and former students at the Minas Gerais Federal University (UFMG).

- Audience: Online Podcast from OBEO Company
- 02 August 2023

Seminar: CONOPs Structuring Methods

- Audience: Air Force Officers
- 20 July 2023

2022

Seminar: Safety Integration Considerations

- Audience: 4th Edition of the Regional Symposium of Unmanned Aircraft Systems
- 07 December 2022

Seminar: Systems Engineering Activities at ITA Space Center

- Audience: ESML (Enterprise Systems Modeling Laboratory) Partnership workshop at Technion University
- 02 November 2022

Seminar: Evaluation Metrics for the Capability Based Planning

- Audience: Workshop of improvements of the Capability Based Planning Workgroup
- 17 October 2022

Seminar: Systems Engineering Introduction and Application Possibilities

- Audience: Institute of Research and Flight Testing (Instrumentation and Testing)
- 03 October 2022

Seminar: Model based Systems Engineering applied to the Lifecycle of systems and materials of the Brazilian Air Force

- Audience: Symposium of Operational Operations in Defense
- 28 September 2022

Seminar: Model based Systems Engineering Possibilities to the future SAE's ARP 4754.

- Audience: EUROCAE WG-63 "Complex Aircraft Systems Committee"
- 01 March 2022

2021

Seminar: Use of OPM in Engineering

- Audience: Honeywell
- 13th April 2021

Seminar: Systems Engineering

- Audience: II International Conference U Experience
- 19th May 2021

Seminar: Systems Engineering into Brazilian Engineering courses

- Audience: INCOSE Brazil
- 19th October 2021

Seminar: Using MBSE to integrate Engineering Undergraduate Courses Curriculum

- Audience: Capella Dayz
- 19th October 2021

2020

Seminar: Space Carrer at Brazil

- Audience: Brazilian Space Agency Forum to High School Students
- 25th September 2020

2019

Seminar: Brazilian Micro-Satellites: yes, they exist

- Audience: ATECH Innovation Forum
- 30th October 2019

Seminar: CubeSast: what and why

- Audience: Professors from the Brazilian Astronomy Olympics
- 6th December 2019

2018

Seminar: Satellite Simulators

- Audience: INPE's Winter Course
- 16th July 2018

Seminar: Model based Systems Engineering

- Audience: INPE's Winter Course
- 16th July 2018

Course: 40h Space Engineering Training to Air Force Officers that use Space Products

- Audience: Air Force Officers
- September 2018

Seminar: CubeSast: what and why

- Audience: Professors from the Brazilian Astronomy Olympics
- 18th December 2018

2017

Seminar: Satellite Simulators

- Audience: INPE's Winter Course
- 11th July 2017

Seminar: Model based Systems Engineering

- Audience: INPE's Winter Course
- 11th July 2017

Course: 40h Space Engineering Training to Public High Schools at the State of Maranhão – BR

- Audience: Public High School System Teachers
- November 2017

Seminar: Model based Systems Engineering and Space 4.0

- Audience: Legislative House of the State of Maranhão
- 30th November 2017

Seminar: CubeSast: what and why

- Audience: Professors from the Brazilian Astronomy Olympics
- 13th December 2017

2016

Seminar: Model Driven Engineering

- Audience: INPE's Winter Course
- 24th July 2016

Seminar: Satellite Simulators

- Audience: INPE's Winter Course
- 13th July 2016

Seminar: Model based Systems Engineering

- Audience: INPE's Winter Course
- 15th July 2016

Seminar: Augmented, Virtual and Cross Reality

- Audience: 23rd Expo ETEP
- 2nd December 2016

2015

Seminar: Satellite Simulators

- Audience: INPE's Winter Course
- 9th July 2015

Seminar: Model based Systems Engineering

- Audience: INPE's Winter Course
- 16th July 2015

Seminar: Object Process Methodology

- Audience: EMBRAER Modeling Team
- 5th August 2015

Seminar: Augmented, Virtual and Cross Reality

- Audience: Electrical Engineering Seminar at the University of Maringá
- 14th October 2015

Mini-course: On demand Augmented Reality Interfaces

- Audience: Symposium of Virtual Reality
- 28th May 2015

Mini-course: Using Augmented Reality into the feedback control-loop of a Drone

- Audience: Workshop on Virtual and Augmented Reality
- 10th November 2015

2014

Mini-course: Development of Cross-Reality Spatial Application using openFrameworks and Arduino

- Audience: Symposium of Virtual Reality
- 11th May 2014

Seminar: Satellite Simulators

- Audience: INPE's Winter Course
- 24th July 2014

Mini-course: Using AR/CR, with markers and others, to control and inspect hardware with Arduino based interfaces

- Audience: Workshop on Virtual and Augmented Reality
- 13th November 2014

2013

Seminar: Introduction to the use of openFrameworks for the Development of Virtual and Augmented Reality Applications

- Audience: Symposium of Virtual Reality
- 27th May 2013

Seminar: Visualization on Satellite Simulation

- Audience: INPE's Winter Course
- 16th July 2013

PROFESSIONAL DEVELOPMENT

- **Space Mission Engineering Course** - Given by Prof. James Wertz, author of the book Space Mission Analysis and Design (SMAD) and the Space Mission Engineering (SME) - done in 2019.
- **Introduction to Model Driven Engineering and its Application for Dependability Analysis** - Given by Prof. Leonardo Montecchi (Università degli Studi di Firenze) - done in 2016.
- **Simulating Spacecraft Systems** - Given by Prof. Dr. -Ing Jens Eickhoff from the University of Stuttgart - done in 2015.
- **Miniature Spacecraft Systems Design** - Given by Prof. Dr. Klaus Schilling (University Würzburg) - done in 2012.
- **Introduction to Systems Engineering** - Given by Prof. Robert Halligan from PPI (Project Performance International) - done in 2009.
- **Winter Course on Satellite and Space Technologies** - Given by INPE personnel (Brazilian Institute for Space Research) - done in 2009.
- **Network Design and CISCO basic level certification (CCNA)** - Given by North Newton Jr./Sr. High School - done at 2000/2001.