JOAO DANTAS

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA *Nov 2021 – Present*
Ph.D. Exchange Program in Robotics

Aeronautics Institute of Technology, Sao Jose dos Campos, Brazil *Jan 2019 – Present*
Ph.D. in Electronic and Computer Engineering
Cum. GPA: 9.5 / 10.0

Aeronautics Institute of Technology, Sao Jose dos Campos, Brazil *Aug 2016 – Dec 2018*
M.Sc. in Electronic and Computer Engineering
Cum. GPA: 8.5 / 10.0

Stony Brook University, Stony Brook, NY *Aug 2016 – Dec 2018*
One-year Undergraduate Exchange Program in Mechanical Engineering
Cum. GPA: 3.93 / 4.00

Aeronautics Institute of Technology, Sao Jose dos Campos, Brazil *Jan 2011 - Dec 2015*
B.Sc. in Mechanical-Aeronautical Engineering
Cum. GPA: 8.7 / 10.0

RESEARCH EXPERIENCE

Robotics Institute, Carnegie Mellon University Nov 2021 – Present
Research Associate, AirLab *Pittsburgh, PA*

Working with **Prof. Dr. Sebastian Scherer** to develop an artificial intelligence system to keep autonomous unmanned aircraft, in conjunction with manned traffic, safely separated and behave as expected when entering and leaving the traffic/break/formation pattern.

Institute for Advanced Studies Jan 2016 – Present
Research Engineer, Decision Support Systems Subdivision *Sao Jose dos Campos, Brazil*

Development of the **Aerospace Simulation Environment**, a custom-made object-oriented simulation framework that enables the modeling and simulation of military scenarios to support the development of tactics and procedures in the aerospace context for the Brazilian Air Force.

Stony Brook University May 2015 – Jul 2015
Undergraduate Researcher, Department of Mechanical Engineering *Stony Brook, NY*

Worked with **Prof. Dr. Carlos Colosqui** on Brownian Motion and methodologies for modeling and numerical analysis of stochastic transport processes, focusing on the dynamics of colloidal particles of micro and nanoscale dimensions at liquidfluid and liquidsolid interfaces

National Council for Scientific and Technological Development Aug 2011 - Jul 2013
Undergraduate Researcher *Sao Jose dos Campos, Brazil*

Worked with **Prof. Dr. Gilberto Petraconi** on the Scientific Initiation Scholarship Program to do research in plasmas, analyzing the effect of electron thermionic emission, and aerospace materials, researching composite materials used in ablative thermo-structural protective coatings for rocket engines

PROFISSIONAL EXPERIENCE

Brazilian Air Force Jan 2013 – Present
Research Engineer *Sao Jose dos Campos, Brazil*

1st Lieutenant Engineer Officer

Research on military **Modeling & Simulation**, **Machine Learning** and **Data Science** for developing decision support systems

COC Educational System Feb 2017 – Jul 2021
Mathematics Teacher and Scientific Olympiads Coordinator *Sao Jose dos Campos, Brazil*

Responsible for the preparatory class for Scientific Olympiads
158 medals and honorable mentions in **46** different national and international competitions

Emerge Brazil Oct 2016 – Dec 2017
Co-founder and Head of Communications *Sao Paulo, Brazil*

Specialized in the development of science-based innovation through the link with cutting-edge science
More than **300** technologies are mapped, with **60** technologies already working in partnership with the Brazilian Industry.

SKILLS

Natural Languages	Native Portuguese ◇ Advanced English
Programming Languages	Python ◇ R ◇ SQL ◇ MATLAB ◇ LaTeX
Deep Learning Framework	Tensorflow ◇ Keras ◇ Pytorch
Python Toolkits	NumPy ◇ Pandas ◇ Matplotlib ◇ Scikit-Learn ◇ SciPy

AWARDS AND HONORS

2022: Fundacão Estudar Merit Scholarship for outstanding trajectory and academic potential (30 recipients out of 33,876 applicants)
2021: 3rd place in the 5th Brazilian Competition on Knowledge Discovery in Databases (KDD-BR)
2021: Military Bronze Medal received from the Brazilian Air Force
2020: Distinguished Fellowship Award for making significant contributions to the Fellows Community, Institute Four
2019: 6th place out of 39 competitors in the 3rd Brazilian Competition on Knowledge Discovery in Databases (KDD-BR)
2019: Ambassador Award of Excellence, International Youth Math Challenge
2019: 4th place in the Data Science Challenge at Engineering Education for the Future (EEF)
2016: Selected by Institute Four to participate at the Prolider Program (29 recipients out of 2,013 applicants)
2015: Honorable Mention in the Department of Humanities, Aeronautics Institute of Technology
2014-2015: Full scholarship from Brazil's Ministry of Education for one-year study program at Stony Brook University, College of Engineering and Applied Sciences ($\approx$ \$75,000)
2014: Military Merit Award from the Brazilian Air Force (25% best military behavior grades among the Officer Candidates)
2011-2013: bf2011: Fellowship of Scientific Initiation Scholarship Program for 24 months, National Council for Scientific and Technological Development
2011: 1st place overall out of 120 Officer Candidates, Brazilian Air Force Reserve Officer Training Corps (CPORAER-SJ)
2011: Approved in the Aeronautics Institute of Technology entrance exam, 120 recipients out of 7627 applicants
2009: Academic Merit Award from the Brazilian Air Force (25% best military grades)

2007: Bronze Medal, 10th Brazilian Olympiad of Astronomy and Astronautics (OBA) (187,726 competitors)
2006: Honorable Mention in the XIV Ceara Science and Biology Olympiad, a competition managed by the Federal University of Ceara, Brazil
2006: Gold Medal in the Internal Science Olympiads in the disciplines of Mathematics, Physics, Chemistry and Biology, Farias Brito High School, Brazil
2004-2006: Full scholarship for three years study program at Farias Brito High School, Brazil ($\approx$ \$30,000)
2003: Honor to Merit for 2nd place for 3 times and 5th place for 1 time in the Internal Mathematics Olympiad, Christus Middle School
2003: 2nd place in the 3rd Christus Exhibition of Science and Technology (EXCETEC) in the area "Exact, Social and Commercial Sciences" with the project "Educational Exodus Study", Christus Middle School, Brazil.

PUBLICATIONS

[1] A. N. Costa, F. L. Medeiros, J. P. Dantas, D. Geraldo, and N. Y. Soma. Formation control method based on artificial potential fields for aircraft flight simulation. *SIMULATION*, 98(7):575–595, 2022.

[2] J. P. Dantas, A. N. Costa, M. R. Maximo, and T. Yoneyama. Enhanced self-organizing map solution for the traveling salesman problem. In *Anais do XVIII Encontro Nacional de Inteligência Artificial e Computacional*, pages 799–802. SBC, 2021.

[3] J. P. A. Dantas. Hexacóptero para monitoramento de construção civil: montagem, testes e operação. Senior Thesis, Instituto Tecnológico de Aeronáutica, São José dos Campos, SP, Brazil, 2015.

[4] J. P. A. Dantas. Apoio à Decisão para o Combate Aéreo Além do Alcance Visual: Uma Abordagem por Redes Neurais Artificiais. Master's Thesis, Instituto Tecnológico de Aeronáutica, São José dos Campos, SP, Brazil, 2018.

[5] J. P. A. Dantas, A. N. Costa, D. Geraldo, M. R. O. A. Maximo, and T. Yoneyama. Engagement decision support for beyond visual range air combat. In *Proceedings of the 2021 Latin American Robotics Symposium, 2021 Brazilian Symposium on Robotics, and 2021 Workshop on Robotics in Education*, pages October 11^{th}–15^{th}, 96–101, 2021.

[6] J. P. A. Dantas, A. N. Costa, D. Geraldo, M. R. O. A. Maximo, and T. Yoneyama. Weapon engagement zone maximum launch range estimation using a deep neural network. In A. Britto and K. Valdivia Delgado, editors, *Intelligent Systems*, pages 193–207, Cham, 2021. Springer.

[7] J. P. A. Dantas, A. N. Costa, V. C. F. Gomes, A. R. Kuroswiski, F. L. L. Medeiros, and D. Geraldo. ASA: A Simulation Environment for Evaluating Military Operational Scenarios. In *Proceedings of the 20^{th} International Conference on Scientific Computing*, 2022.

[8] J. P. A. Dantas, A. N. Costa, F. L. L. Medeiros, D. Geraldo, M. R. O. A. Maximo, and T. Yoneyama. Supervised Machine Learning for Effective Missile Launch Based on Beyond Visual Range Air Combat Simulations. In *Proceedings of the Winter Simulation Conference*, WSC '22, 2022.

[9] J. P. A. Dantas, J. A. da Cunha, J. L. Silva, A. O. Arantes, and V. C. F. Gomes. Análise exploratória de dados de acidentes aeronáuticos no brasil. *Revista Conexão SIPAER*, 9(2):106–127, 2018.

[10] J. P. A. Dantas and C. A. de Melo Silvestre. Teoria dos jogos aplicada ao combate bvr. *Aplicações Operacionais em Áreas de Defesa*, 20, 2017.

[11] J. P. A. Dantas and C. A. de Melo Silvestre. Modelo de simulação aplicado às missões de transporte na região amazônica. *Aplicações Operacionais em Áreas de Defesa*, 21:10–15, 2020.

[12] J. P. A. Dantas, C. A. de Melo Silvestre, D. A. Pamplona, and A. Tavares de Azevedo. Modelo de simulação aplicado à logística aérea na região amazônica. In *Anais do III Encontro Regional de Pesquisa Operacional do Sudeste*, 2018.

[13] J. P. A. Dantas, M. R. O. A. Maximo, A. N. Costa, D. Geraldo, and T. Yoneyama. Machine Learning to Improve Situational Awareness in Beyond Visual Range Air Combat. *IEEE Latin America Transactions*, 20(8), 2022.

[14] J. P. A. Dantas and G. Petraconi Filho. Estudo de uma descarga de catodo termiônico em baixa pressão. In *Anais do XVIII Encontro de Iniciação Científica e Pós-Graduação do ITA - XVIII ENCITA*, 2012.

[15] J. P. A. Dantas and G. Petraconi Filho. Aquisição automática de dados em ensaios de materiais de barreira térmica realizados em túnel de plasma supersônico. In *Anais do XIX Encontro de Iniciação Científica e Pós-Graduação do ITA - XIX ENCITA*, 2013.

[16] J. Patrikar, J. P. Dantas, S. Ghosh, P. Kapoor, I. Higgins, J. J. Aloor, I. Navarro, J. Sun, B. Stoler, M. Hamidi, et al. Challenges in close-proximity safe and seamless operation of manned and unmanned aircraft in shared airspace. In *Aerial Robotics Workshop, International Conference on Robotics and Automation (ICRA) 2022*, 2022.

VOLUNTEERING

International Astronomy and Astrophysics Competition Apr 2020 – Jul 2021
Ambassador *Sao Jose dos Campos, Brazil*

Working to enables motivated students and supportive mentors to inspire youths for astronomy and astrophysics and to encourage them to participate in the competition

International Youth Math Challenge Jul 2019 – Jul 2021
Ambassador *Sao Jose dos Campos, Brazil*

Working to inform schools and encourage students and youths to participate in the competition

Alpha Lumen Institute Jun 2012 - May 2013
Mathematics Teacher *Sao Jose dos Campos, Brazil*

Teacher of mathematics in the preparatory class for the Aeronautics Institute of Technology entrance exam

ADDITIONAL ACTIVITIES

Competitive basketball player (2007-2009) – Brazilian Air Force Academy, Pirassununga, Brazil
Amateur bodybuilder (2014-2015) – The National Physique Committe
Hobbies: hiking, cooking, traveling

August 14, 2022