Victor Alves

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Education

West Virginia University — Morgantown, WV, USA
Ph.D. Candidate (ABD Status), Chemical Engineering; — *Aug 2020 – May 2024 (Expected, flexible)*
GPA: 3.80/4.00

Federal University of Campina Grande — Campina Grande, Paraiba, Brazil
M.Sc., Chemical Engineering; — *Sep 2017 – Mar 2020*
Academic Coefficient: 10.00/10.00

University of Birmingham — Birmingham, UK
B.Sc., Chemical Engineering (Exchange Student); — *Sep 2014 – Aug 2015*
British Degree Classification: Upper Second

Federal University of Campina Grande — Campina Grande, Paraiba, Brazil
B.Sc., Chemical Engineering; — *Mar 2012 – Mar 2017*
Academic Coefficient: 8.69/10.00

Research Experience

West Virginia University — Morgantown, WV, USA
Graduate Research Assistant (Ph.D.) — *Aug 2020 – Currently*

- Currently working with Dr. Fernando V. Lima on the development of emerging techniques for process operability calculations, involving mainly supervised machine-learning, constrained nonlinear programming (NLP) and automatic differentiation (AD) for efficient algorithm development.
- Development of an open-source Python package for process operability calculations, for ease-of-use and dissemination of operability algorithms in academia and industry.
- Control, Optimization and Design for Energy and Sustainability (CODES) Research Group leader, supervising the group's activities, as well as organizing the semester schedule, workshops, weekly meetings and relevant announcements.

Federal University of Campina Grande — Campina Grande, Paraiba, Brazil
Graduate Research Assistant (M.Sc.) — *Sep 2017 – Mar 2020*

- M.Sc. thesis: "Metamodel-based Numerical Techniques for Self-Optimizing Control": Developed a methodology capable of using Gaussian Process Regression (GPR) to aid the optimal selection of controlled variables (CVs) in industrial processes, following the Self-Optimizing Control (SOC) methodology.

Work Experience

West Virginia University — Morgantown, WV, USA
Graduate Research Assistant (Ph.D.) — *Aug 2020 – Currently*

- Tutored undergraduate students at the senior level, allowing them to be introduced to scientific research in process systems engineering, process modeling (steady-state/dynamics), process operability concepts and control.
- Collaborated with Dr. Fernando V. Lima as his Teaching Assistant for the Chemical Process Control course, undergraduate senior-level. Prepared lectures, tutorials in MATLAB/Simulink and problem sets for students, in a problem-based learning fashion.

Federal University of Campina Grande — Campina Grande, Paraiba, Brazil
Graduate Research Assistant (M.Sc.) and Developer — *Sep 2017 – Mar 2020*

- Research and development of BRPWC for PETROBRAS: An automated software capable of easily selecting the most promising self-optimizing control structures in industrial processes.
- Worked on developing the calculation engine in Python for BRPWC, based on the research results from my Master's thesis.
- Conceptualized the user interface for BRPWC, generating mock-ups that were sent to the computer science team to develop the front-end interface.

SigmaCT as a contractor to Braskem — Marechal Deodoro, Alagoas, Brazil
Process Engineering Intern — *Mar 2017 – Sep 2017*

- Worked as a process engineering intern in Vinyl Chloride Monomer (VCM) and Polyvinyl Chloride (PVC) production plants.
- Developed simulations in Aspen Plus and Aspen Plus Dynamics to investigate operating regions of the VCM/PVC plants.

Selected Research Publications - Complete list on my Google Scholar.

José J.N. Alves, Antônio T.P. Neto, Antônio C.B. Araújo, Heleno B. Silva, Sidinei K. Silva, Claudemi A. Nascimento, and Aurélio M. Luiz. "Overview and experimental verification of models to classify hazardous areas". en. In: *Process Safety and Environmental Protection* 122 (Feb. 2019), pp. 102–117. ISSN: 09575820. DOI: 10.1016/j.psep.2018.11.021. URL: https://linkinghub.elsevier.com/retrieve/pii/S0957582018304968 (visited on 07/12/2022).

Paloma L. Barros, Aurélio M. Luiz, Claudemi A. Nascimento, Antônio T.P. Neto, and José J.N. Alves. "On the non-monotonic wind influence on flammable gas cloud from CFD simulations for hazardous area classification". en. In: *Journal of Loss Prevention in the Process Industries* 68 (Nov. 2020), p. 104278. ISSN: 09504230. DOI: 10.1016/j.jlp.2020.104278. URL: https://linkinghub.elsevier.com/retrieve/pii/S0950423020305659 (visited on 01/11/2024).

Claudemi A. Nascimento, Aurélio M. Luiz, Paloma L. Barros, Antônio T.P. Neto, and José J.N. Alves. "A CFD-based empirical model for hazardous area extent prediction including wind effects". en. In: *Journal of Loss Prevention in the Process Industries* 71 (July 2021), p. 104497. ISSN: 09504230. DOI: 10.1016/j.jlp.2021.104497. URL: https://linkinghub.elsevier.com/retrieve/pii/S0950423021001066 (visited on 07/12/2022).

Projects

Opyrability: Process Operability Analysis in Python | *Website*

- Opyrability - A Python-based pacakge for process operability analysis - is an open-source project for advanced process operability analyses. The opyrability codebase includes the main operability algorithms, supplementary analysis and visualization methods to allow for the assessment of simultaneous design and control objectives early in the conceptual phase.

Metacontrol | *Website*

- Metacontrol is a Python-based software that assembles several methodologies into a single bundle so that a fast implementation of the Self-Optimizing Control (SOC) technique can be achieved.
- Metancontrol's calculation engine and main steps were conceptualized during my Master's thesis.

Teaching

Chemical Process Control — West Virginia University
Teaching Assistant — *Spring, 2023*

Skills

Programming: Python, MATLAB, Markdown, ReStructuredText, LaTeX and exposure to R

Technologies/Platforms: Git, GitHub, GitLab, Docker, Simulink, JAX

Process simulation: Aspen Plus, Aspen Plus Dynamics, Aspen Custom Modeler, HYSYS, AVEVA Process Simulation, PRO/II, Dynsim

Languages: English and Portuguese

Relevant Coursework

Major coursework: Transport Phenomena, Advanced Chemical Engineering Thermodynamics, Chemical Reaction Engineering, Mathematical Methods in Chemical Engineering, Statistical Methods, Oil and Gas Refining, Teaching Practicum

Minor coursework: Dynamic Simulations, Linear Control Systems, Advanced Optimization