Allan Gurwicz

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EDUCATION

Ph.D. in Industrial Engineering, **Texas A&M University** – College Station, TX — Fall 2023 to Present
- Concentration: Operations Research.
- Advisors: Dr. David Huckleberry Gutman and Dr. Eduardo Gildin.

Ph.D. in Industrial Engineering, **Texas Tech University** – Lubbock, TX — Fall 2021 to Summer 2023
- Concentration: Operations Research.
- Advisor: Dr. David Huckleberry Gutman.
- Transferred to Texas A&M University.

Master of Electrical Engineering, **Pontifical Catholic University of Rio de Janeiro** – Rio de Janeiro, Brazil — March 2018 to January 2020
- Concentration: Decision Support Methods.
- Thesis: Deep Generative Models for Reservoir Data: An Application in Smart Wells. DOI: 10.17771/PUCRio.acad.48317.
- Advisor: Dr. Marco Aurélio Cavalcanti Pacheco; Co-advisors: Dr. Ana Carolina Alves Abreu and Dr. Smith Arauco Canchumuni.
- Funded by the Brazilian National Council for Scientific and Technological Development (CNPq).

Bachelor of Petroleum Engineering, **Pontifical Catholic University of Rio de Janeiro** – Rio de Janeiro, Brazil — March 2013 to December 2017
- Minor in Entrepreneurship.

PROFESSIONAL EXPERIENCE

Research Assistant, **Department of Industrial & Systems Engineering, Texas A&M University** – College Station, TX — September 2023 to Present
- Research on the novel application of survival analysis methods towards building reservoir simulator surrogates.
- Created and successfully implemented a methodology that leverages the power of survival analysis to predict the risk of CO_2 leakage in long-term CCS projects. This greatly reduces the reliance in computationally expensive reservoir simulations while maintaining high interpretability and promoting model qualities such as sparsity and training cheapness. The methodology is the first instance of survival analysis applied to carbon storage optimization in the literature.

Research and Software Development Intern, **CNPC USA** – Houston, TX — June 2024 to August 2024
- Actively contributed to the development of a research tool for the drilling dynamics group that processes and analyzes data coming from multiple varied sources, such as computer simulations, laboratory experiments and field sensors.
- Led the effort on implementing a deployment strategy for the software and successfully converted the tool to a *pip install*-based installation, lowering the entry barrier for new users and completely removing the burden on the user to track dependencies.
- Created the corporation's GitHub organization and gave company-wide training sessions on how to use the instrument and migrate existing workflows to Git and GitHub.
- Supervised by Dr. Lance Endres.

Research Assistant, **Department of Industrial, Manufacturing & Systems Engineering, Texas Tech University** – Lubbock, TX — August 2021 to August 2023
- Part of a project in partnership with General Motors, which aimed to optimize the throughput of its assembly lines via statistical methods and machine learning. A pilot program was implemented in the General Motors Wentzville Assembly plant and two patents were published.

Researcher, **Applied Computational Intelligence Laboratory (ICA/PUC-Rio)** – Rio de Janeiro, Brazil — March 2018 to July 2021
- DOREE: Software that leverages genetic algorithms for the optimization of subsea production systems.
  - Part of the team tasked with building the program from the ground up. Custom-built a genetic algorithm to suit the problem's requirements, led the creation of front-end and back-end and managed their continuous development and maintenance.
  - Coordinated the communication with the end client, taking point in understanding their needs and leading the project's decision-making process.
  - Created libraries for communication with reservoir and flow simulation software, including parsing and writing models, as well as running simulations and interpreting results, in both local computers and HPC clusters.
- Flexwell: Methodology and software capable of estimating the value of information and flexibility brought by the use of smart wells.
  - Drove the search for gaps in the methodology open to improvement, conducting research and implementing new features.
  - Research in the use of deep learning for reservoir simulator substitution. Successfully implemented a Long Short-Term Memory Network-based simulator proxy, leading to reduction in well control optimization time.
  - Conceived and developed a methodology for the generation of reservoir data via Generative Adversarial Networks, diminishing the need for computationally expensive simulations in the training of the proxy.
- MANNTIS: Deep learning for subsea object detection and classification.
  - Research into various approaches and networks, aiming to obtain better results by tailoring the methodology to the data in question.
  - Spearheaded the inclusion of the developed software in the end client's workflow, easing the introduction of deep learning to a traditionally human-based task.

Intern, **Applied Computational Intelligence Laboratory (ICA/PUC-Rio)** – Rio de Janeiro, Brazil — May 2017 to February 2018
- Responsible for research, translation and formatting of technical papers, with further submission and acceptance to journals and periodicals in the Oil & Gas and Artificial Intelligence areas.

Consultant, **RBNA Consult** – Rio de Janeiro, Brazil — November 2017
- Part of the team responsible for the valuation of two Petrobras rigs, which were then led to bidding.

- Provided crucial insights to the project, such as in relation to tax and to the rig market. The discounted cash flow method was used in order to find a suitable sale value, which was then compared to research done on the rig market at the time as to ascertain an acceptable price range.
- The winning bid was within the range suggested to the client, as well as the final destination of the rigs.

Development and Production Intern, **Brazilian National Agency of Petroleum, Natural Gas and Biofuels** – Rio de Janeiro, Brazil   October 2016 to April 2017
- Elaboration of technical papers to support the board of directors' decisions.
- Analysis of oil & gas fields' cash flow, development plans and related documents, with close contact to the operator companies.

PUBLICATIONS & WORKING PAPERS

Assessing Risk In Long-term CO_2 Storage Under Uncertainty Via Survival Analysis-based Surrogates
Gurwicz, A.; Chen, J.; Gutman, D. H.; Gildin, E.
- Accepted for publication at *SPE Journal*.

Solving the Substitution-tolerant Subgraph Isomorphism Problem
Gurwicz, A.; Validi, H.; Gutman, D. H.
- In preparation towards submission to *INFORMS Journal on Computing*.

PATENTS

Systems and Methods for Identifying and Alerting of Footprint Over-Cycle Risks on Multi-Product General Assembly Lines
Carroll, D. J.; Wiley, C. A.; Danda, S. R. K.; Jeet, V.; Remutula, P.; Clark, K. A.; Morrow, M.; Gutman, D. H.; **Gurwicz, A.**; Fernandes, G. L. N.
- Patent filed with the USPTO on 03/13/2023 and published on 09/19/2024 under no. US 2024/0308781 A1. Pending.

Methods for Simulating Conveyor Cycles on Multi-Product General Assembly Lines
Carroll, D. J.; Wiley, C. A.; Jeet, V.; Finnin, A.; Clark, K. A.; Morrow, M.; Gutman, D. H.; Chen, L.; **Gurwicz, A.**; Fernandes, G. L. N.; Zaman, M.; Nguyen, N.
- Patent filed with the USPTO on 03/13/2023 and published on 09/19/2024 under no. US 2024/0311730 A1. Pending.

PROCEEDINGS & PRESENTATIONS

Assessing Risk In Long-term CO_2 Storage Under Uncertainty Via Survival Analysis-based Surrogates
Gurwicz, A.*; Chen, J.; Gutman, D. H.; Gildin, E.
- Proceedings of the *SPE Annual Technical Conference and Exhibition (ATCE)*, 2024. DOI: 10.2118/220737-MS.

Smart Well Data Generation via Boundary-Seeking Deep Convolutional Generative Adversarial Networks
Gurwicz, A.*; Canchumuni, S. A.; Pacheco, M. A. C.
- Proceedings of the *18th International Conference on Artificial Intelligence and Soft Computing (ICAISC)*, 2019. DOI: 10.1007/978-3-030-20912-4_7.

Forecasting Smart Well Production via Deep Learning and Data Driven Optimization
Calvette, T.; **Gurwicz, A.***; Abreu, A. C. A.; Pacheco, M. A. C.
- Proceedings of the *Offshore Technology Conference (OTC) Brasil*, 2019. DOI: 10.4043/29861-MS.

A Smart-Well-Centered Investigation into Deep Generative Models for Reservoir Data
Gurwicz, A.*; Abreu, A. C. A.; Canchumuni, S. A.; Pacheco, M. A. C.
- Presentation at the *II Seminar of Artificial Intelligence Applied to the Oil & Gas Industry*, 2020.

Optimization of Offshore Oil and Gas Production Systems During Design Phase
Fulchignoni, L. P.; Kohler, M. R.; **Gurwicz, A.***; Abreu, A. C. A.; Abreu, D.; Rodrigues, H. T.; Pacheco, M. A. C.
- Presentation at the *I Seminar of Artificial Intelligence Applied to the Oil & Gas Industry*, 2019.

LSTM Networks and Box-Jenkins Models Applied to Load Forecasting for a Southeastern Brazil Giant Energy Consumer
Nunes, A.; da Conceição, L.; Mendoza, L. F.; de Mello Jr., H. D.*; **Gurwicz, A.**; Figueiredo, K.
- Proceedings of the *14th Brazilian Congress on Computational Intelligence (CBIC)*, 2019 (in Portuguese). DOI: 10.21528/CBIC2019-100.

Hourly Load Forecasting as a Parameter for a Short-Term Pricing and Hydrothermal Dispatch Model
da Silva, M.; dos Santos, P.; Mendoza, L. F.; de Mello Jr., H. D.*; **Gurwicz, A.**
- Proceedings of the *14th Brazilian Congress on Computational Intelligence (CBIC)*, 2019 (in Portuguese). DOI: 10.21528/CBIC2019-96.

*Presenting author.

AWARDS

1st Place, *2024 Zorich's Reliability Workshop* Poster Competition.
- Hosted by the Departments of Statistics and Industrial & Systems Engineering at Texas A&M University.

TEACHING

- "Introduction to Git and GitHub" workshop for Petroleum Engineering graduate students at Texas A&M University.
- "Git and GitHub for Portfolio Creation" course in the "Business Intelligence Master" extension program at the Pontifical Catholic University of Rio de Janeiro.

SKILLS

- Python   - C#   - MATLAB   - LaTeX   - Gurobi   - Git/TFS   - Docker   - Windows/macOS/Linux   - Microsoft Office

OTHER INFO

- Fluent in English and Portuguese, working knowledge of Spanish and Hebrew.
- Brazilian and Polish citizenship.

MEMBERSHIPS

Society of Petroleum Engineers   March 2013 to Present