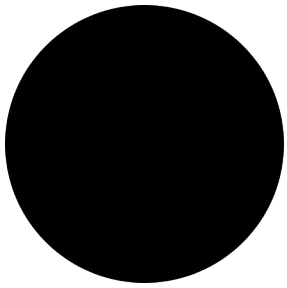

DR. ARTUR CASTIEL REIS DE SOUZA

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Scientific Programmer & Expert in CFD for Porous Media

Find more information at my website: arturcastiel.github.io

ABOUT

Specialist in Computational Fluid Dynamics for multiphase flow on subsurface porous media. Skilled in scientific programming and reservoir modeling with a track record of delivering high quality results. Experienced developing state of the art technology in the fields of Grid Generation and Adaptation, Numerical Methods, Linear Non-linear Flux Approximation, Multiscale Methods, Fractured Media Modeling. Easy going with excellent communication skills.

RESEARCH EXPERIENCE

DELFT INSTITUTE OF TECHNOLOGY

Delft, South Holland, Netherlands - Since 2022

Post-doctoral Researcher

- Study and development of methods for the generalization of embedded fracture model and variations to general unstructured grids.

EDUCATION

UNIVERSIDADE FEDERAL DE PERNAMBUCO

Recife, Pernambuco - Brazil - July, 2022

PhD in Civil Engineering - GPA 4.0/4.0

- Development of computational fluid dynamics methods for fluid flow in porous media. Development of linear and non-linear Finite Volume and Multiscale Finite Volume schemes for unstructured grids.

SWANSEA UNIVERSITY

Swansea, Wales, United Kingdom - February 2020 to February 2021

Visiting PhD Student

- Development of a general-purpose grid generation algorithm for the creation unstructured dual meshes and the development repair techniques to remove spurious oscillations from linear Multi-Point Flux Approximation schemes.

UNIVERSIDADE FEDERAL DE PERNAMBUCO

Recife, PE - Brazil - January 2019,

MSc in Civil Engineering - GPA 3.9/4.0

- Development of a Multiscale Finite Volume method for the simulation of two-phase flow in unstructured grids using Multi-Point Flux Approximation schemes.

UNIVERSIDADE DE PERNAMBUCO

Recife, PE - Brazil – May 2012

BSC in Mechanical Mechatronics Engineering,

AWARDS

- ABMEC Award for Best Doctoral Thesis of the Year - Honorable Mention, Brazilian Association for Computational Methods in Engineering
- i-LITPEg Award - Award for Best Thesis of the Year 2023, Brazil, Institute of Petroleum and Energy Research
- PhD scholarship, Energi Simulation Foundation.
- Visiting PhD student in Swansea University, National Council for Scientific and Technological Development (CNPq).

TEACHING EXPERIENCE

UNIVERSIDADE TIRADENTES

Recife, PE, Brazil, February 2022 to August 2022

Assistant Lecturer - Subject: Dynamic Modelling and Heat Transfer disciplines.

UNIVERSIDADE DE PERNAMBUCO

Recife, PE, Brazil - August 2017 to December 2017

Assistant Lecturer - Subject: Electricity and Electromagnetic Physics disciplines.

FACULDADE MAURÍCIO DE NASSAU

Recife, PE - Brazil - August 2014 – July 2015

Instructor - Telecommunications Technician Course - Subjects: CAD/CAM, Auto Cad, Introduction to Programming, and Computer Networks

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SKILLS

Scientific Programming: MATLAB, Python, Numpy, Scipy, C/C++, Object-oriented and Array programming, Git, Latex, Linux,Visit, ParaView, Inkscape, GIMP

Technology: Docker, Raspberry Pi , Ubuntu, HTML, CSS, Bootstrap, Javascript.Autodesk AutoCad, Autodesk Inventor, Microstation, Ansys

Languages: Native Portuguese Speaker, Fluent in English (IELTS score 7.5/9), Advanced French and Spanish, and Intermediary German skills.

PUBLICATIONS

- **Souza, A. C. R.**; Carvalho, D. K. E.; Cavalcante, T.M.; Contreras, F. R. L.; Edwards, M. G.; Lyra, P. R. M.; A nonlinear repair technique for the MPFA-D scheme in single-phase flow problems and heterogeneous and anisotropic media, Journal of Computational Physics (2022)
- Cavalcante, T.M.; Lira Filho, R. J. M.; **Souza, A. C. R.**; Carvalho, D. K. E.; Lyra, P. R. M.; A Multipoint Flux Approximation with a Diamond Stencil and a Non-Linear Defect Correction Strategy for the Numerical Solution of Steady State Diffusion Problems in Heterogeneous and Anisotropic Media Satisfying the Discrete Maximum Principle, Journal of Scientific Computing (2022)
- Santos, J. C. A.; Lyra, P. R. M.; Andrade, J. P. R.; **Souza, A. C. R**.; Lira Filho, R. J. M.; Carvalho, D. K. E.; An Algebraic Dynamic Multilevel and Multiscale Method with Non-Uniform Mesh Resolution and Adaptive Algebraic Multiscale Solver Operator for the Simulation of Two-Phase Flows in Highly Heterogeneous Petroleum Reservoirs, Journal of Computational Physics (2022)
- **Souza, A. C. R.**; Carvalho, D. K. E.; Santos, J. C. A.; Willmersdorf, R. B.; Lyra, P. R. M.; Edwards, M. G. An algebraic multiscale solver for the simulation of two-phase flow in heterogeneous and anisotropic porous media using general unstructured grids (AMS-U) , Applied Mathematical Modelling (2022)
- **Souza, A. C. R.**; Barbosa, L. M. C.; Contreras, F. R. L.; Lyra, P. R. M.; Carvalho, D. K. E. A multiscale control volume framework using the multiscale restriction smooth basis and a non-orthodox multi-point flux approximation for the simulation of two-phase flows on truly unstructured grids, Journal of Petroleum Science and Engineering (2020)
- **Souza, A. C. R.;** Cavalcante, T. M.; Carvalho, D. K. E.; Lyra, P. R. M., Edwards, M.G. Numerical Simulation of the Diffusion Equation Via a Non-Linear Flux Splitting Technique with the Multipoint Flux Approximation Method with a Diamond Stencil Satisfying the Discrete Maximum Principle Using 2-D Unstructured Meshes, COBEM (2021) - Proceedings of the 26th International Congress of Mechanical Engineering
- Silva, R.N.T.; MATOS, G. M.; **Souza, A. C. R.;** LIRA FILHO, R. J. M.; Carvalho, D. K. E. de; Lyra, P. R. M., . Some Results on the Accuracy of a Classical Upscaling Technique Using an Intuitive Mul-tilevel Preprocessor for Smart Simulation, CILAMCE (2020) - Ibero-Latin American Congress on Computational Methods in Engineering
- Santos, J. C. A.; Andrade, J. P. R.; **Souza, A. C. R**.; Lira Filho, R. J. M.; Carvalho, D. K. E. de; Lyra, P R M An Adaptive Algebraic Dynamic Multilevel (A-ADM) and Multiscale Method with Enriched Basis Functions for the Simulation of Two-Phase Flows in Highly Heterogeneous Petroleum Reservoirs, CILAMCE (2020) - Ibero-Latin American Congress on Computational Methods in Engineering
- Juvito, L.B.; Ramirez, G.; **Souza, A. C. R.**; Carvalho, D. K. E. de; Lyra, P. R. M. An iterative MsCV method coupled to the high-resolution CPR approach via different solution smoothers for the simulation of oil-water flows in 2D petroleum reservoirs on unstructured grids. , CILAMCE (2020) - Ibero-Latin American Congress on Computational Methods in Engineering
- **Souza, A. C. R.**; Barbosa, L. M. C.; Carvalho, D. K. E.; Lyra, P. R. M. A MsCV framework using a non-orthodox MPFA-D for the simulation of two-phase flows on truly unstructured grids, CILAMCE (2017) - Ibero-Latin American Congress on Computational Methods in Engineering.

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