


# André Brasil Vieira Wyzykowski

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## EDUCATION

### MICHIGAN STATE UNIVERSITY (MSU)

POSTDOCTORAL RESEARCHER   
Jun 2022 - Present | East Lansing, MI, US

### FEDERAL UNIVERSITY OF BAHIA (UFBA)

DOCTOR OF COMPUTER SCIENCE  
Oct 2017 - Feb 2022 | Salvador, Brazil

### FEDERAL UNIVERSITY OF SANTA CATARINA (UFSC)

MASTER OF COMPUTER SCIENCE  
Aug 2015 - Aug 2017 | Florianópolis, Brazil

### UNIVERSITY OF VALE DO ITAJAÍ

BACHELOR OF COMPUTER SCIENCE  
Feb 2011 - Jul 2015 | Florianópolis, Brazil

### COLEGIO SALESIANO DO SALVADOR

SECONDARY SCHOOL  
Feb 2005 - Dec 2007 | Salvador, Brazil

## SKILLS

### COMPUTER SCIENCE

Artificial Intelligence  
Biometrics  
Fingerprint synthesis  
Computer Vision  
Imaging Processing  
Image recognition

### PROGRAMMING

Python  
C++  
PyTorch  
TensorFlow

### LANGUAGES

Portuguese: |★★★★★| (native speaker)  
English: |★★★★|  
Spanish: |★★★★|  
French: |★★|

## AWARD



IV Sinapse da Inovação Santa Catarina (Innovation and Entrepreneurship), FAPESC, Government of Santa Catarina

## RESEARCH

### MICHIGAN STATE UNIVERSITY | POSTDOCTORAL RESEARCHER

Jun 2022 - Present | East Lansing, MI, US   
Collaborating with Dr. Anil K. Jain on research focused on latent fingerprint synthesis and the development of a novel latent fingerprint enhancement utilizing deep learning techniques.


### UNIVERSITY OF SOUTH FLORIDA | FEDERAL UNIVERSITY OF BAHIA: PhD

Oct 2017 - Feb 2022 | Tampa, US and Salvador, Brazil    
Developed a groundbreaking method for generating high-resolution fingerprints, producing results analogous to authentic datasets. Completed a six-month academic visit to the University of South Florida under the supervision of Dr. Sudeep Sarkar.


### UNIVERSIDAD DE CHILE - UCHILE - SOCIALCONNECTOR | FONDECYT - NUMBER 1150252

Sep. 2016 - Sep. 2016 | Santiago, Chile   
Collaborated with Dr. Sergio Ochoa on the development of face detection algorithms aimed at assisting elderly individuals in their homes.

### ARTIFICIAL INTELLIGENCE AND EDUCATIONAL TECHNOLOGY LABORATORY (IATE - UFSC) | MASTER DEGREE

Aug. 2015 - Aug. 2017 | Florianópolis, Brazil   
Partnered with Dr. Jerusa Marchi on the creation of an image feature extraction algorithm, intended for use in a navigation system to support visually impaired individuals.

### INSTITUTIONAL PROGRAM FOR TECHNOLOGICAL DEVELOPMENT AND INNOVATION (PROINOVA) | UNIVALI

Aug. 2014 - Jul. 2015 | São José, Brazil   
Contributed to the development of the project, Software Solutions for Counting and Classifying Male Reproductive Cells in Holographic Microscopy Images.

## EXPERIENCE

### MICHIGAN STATE UNIVERSITY

#### POSTDOCTORAL RESEARCHER

Jun. 2022 - Present | East Lansing, MI, US  
Conducting research on latent fingerprints, fingerprint synthesis, fingerprint image enhancement, and Automated Fingerprint Identification System (AFIS).

### CATHOLIC UNIVERSITY OF SALVADOR (UCSAL)

#### ASSISTANT PROFESSOR

Mar. 2018 - 2022 | Salvador, Brazil  
Taught various courses, including artificial intelligence, advanced topics in programming, experimental software engineering, software evolution, software engineering paradigms and tools, and supervised final projects.

### OBYRAMA

#### MANAGING PARTNER

Feb. 2014 - May. 2015 | Florianópolis, Brazil  
Developed and managed business initiatives.

### KHOMP

#### SENIOR SOFTWARE ENGINEER

Feb. 2010 - May. 2013 | Florianópolis, Brazil  
Developed software for embedded devices.

## SUMMARY/OBJECTIVE

André Brasil Vieira Wyzykowski is a highly skilled Computer Scientist with a strong background in Artificial Intelligence, Biometrics, and Computer Vision. With experience in both academia and the tech industry, André has contributed to numerous research projects, developed innovative methods, and taught various courses. Fluent in multiple languages, he is dedicated to leveraging his expertise in the development of cutting-edge solutions and fostering collaboration in a global research environment.

## PHD AWARDS (FEDERAL UNIVERSITY OF BAHIA)

1. **BEST PRESENTATION RATED BY THE AUDIENCE OF THE VI PGCAMP STUDENT WORKSHOP (WEPGCAMP 2021).**
2. **BEST PRESENTATION OF THE IV PGCAMP STUDENT WORKSHOP (WEPGCAMP 2019).**

## COMPUTER SCIENCE COURSES (DOCTORATE AND MASTER'S DEGREE)

Aug 2015 - Dec 2021 | Florianopolis, Salvador, Brazil

1. **TOPICS IN VISUAL COMPUTING:** Image database organization, linear regression, logistic regression, multilayer perceptron, optimization, logistic regression + MLP using TensorFlow and Pytorch, CNN, dropout, weight decay and batch normalization, ensembles and augmentation, autoencoders, GANs.
2. **ARTIFICIAL INTELLIGENCE:** Knowledge representation, automated reasoning, search methods, machine learning, agents and multi-agents, probabilistic methods (Bayes and Markov).
3. **TOPICS IN COMPUTATIONAL INTELLIGENCE:** Machine learning, fuzzy systems, fuzzy time series, expert systems, genetic algorithms, neural networks, introduction to artificial neural networks, gradient descent, activation functions, multilayer perceptron, data augmentation.
4. **ALGORITHMS AND GRAPHS:** Algorithm concepts, algorithm analysis and efficiency, algorithm design (induction, divide and conquer, dynamic programming, greedy method), NP-completeness (theory and demonstration technique), complexity classes (P, NP, NP-complete, NP-hard), polynomial reductions, algorithms for NP-complete problems, basic concepts of graphs and algorithms to solve problems modeled in graphs, connectivity, distances, stability and chromatic number, trees, planar graphs, paths, topological sorting, coloring.
5. **ALGORITHM DESIGN AND ANALYSIS:** Introduction to algorithm analysis and design, complexity, asymptotic notation, recurrences, divide and conquer algorithms, graph algorithms, greedy algorithms, dynamic programming, NP-complete problems, reductions, techniques for handling complex problems.
6. **STATISTICAL METHODS:** Types of research and statistics, survey, experimental and simulation research, research planning, data analysis, exploratory data analysis, presentation of statistical software, frequency distribution and histogram, location and dispersion measures, box plots, probabilistic modeling, concept of random variable and probability distribution, binomial and Poisson models, uniform, exponential and normal models, general comments on random number generation and simulation, statistical inference, basic concepts: parameters, statistics and sample distributions, parameter estimation, confidence intervals, hypothesis tests, t-test for comparing two computer systems.
7. **THEORY OF COMPUTATION:** Programs, machines, and computations, Turing machines, recursive functions, computability, decidability, analysis and complexity of algorithms, classes and complexity of computational problems.
8. **REAL-TIME SYSTEMS:** Definition of basic concepts and the importance of computational systems for real-time applications, software engineering of real-time systems, presentation of main methodologies, operating systems programming for real-time applications, scheduling methods, comparative analysis of existing operating systems, distributed real-time systems, timing and synchronization issues.
9. **FUNDAMENTALS OF RESEARCH IN COMPUTER SCIENCE:** Science and the scientific method, science and computer science, reading scientific articles, empirical data analysis techniques, graphical presentation of empirical data techniques, conducting empirical research, planning surveys and questionnaires, experiment design, validation of empirical investigations, measurement, analysis of data from experiment designs, case study planning, systematic reviews and mappings, writing and presentation of a scientific article.
10. **TEACHING INTERNSHIP 2017, 2019, 2020:** Teaching internship in the courses of Computer Theory and C++ programming at the Federal University of Bahia.

## MANAGEMENT

Worked as a managing partner at the company Obyrama, participating in the Technological Innovation Center of Univali (Uniinova) from Aug. 2013 to May. 2015.

## PAST STUDENTS (UNDERGRADUATE)

Jul. 2019 - Dec. 2021 | Salvador, Brazil | Manuscripts titles (PT-BR), translated by google translator.

1. Gabryela Santana Barros and Lielson R. Pereira Junior. Experimental analysis between TDD and Test-Last techniques in the corrective software maintenance process. 2019.
2. Murilo Guerreiro Arouca. Risk Signaling: A Gamified Application for Participatory Risk Mapping. 2019.
3. Felipe Deveza de Almeida and Hudson Luís da Silva Costa. Iridescent: A serious game aiming to identify the possibility of adopting a psychological test based on DASS-21. 2019.
4. Carlos Daniel Santana Cruz. Development of an IoT System Focused on Accessibility in Urban Mobility. 2019.
5. Danilo Silva Gonçalves. e-Coach: A League of Legends team and character recommendation system using multilayer neural networks. 2019.
6. Luiz Henrique Brito Rios and Adriano Ricardo Andrade Araújo. ROBOT COBRA: System for the Identification of Living Organisms in Collapsed Structures. 2020.
7. Ícaro Santana and Sérgio Matheus. Synthesis of X-ray images of respiratory problems using adversarial generative neural networks. 2020.
8. Rafael Rembrandt Aquino. WGAN adaptation to the stochastic process. 2020.
9. Rodrigo Soares. SED99 - Evolution Dataset Software - 99 repositories. 2020.
10. Saulo de Andrade. Covid-19 detection in thoracic medical imaging using convolutional neural networks (CNN). 2020.
11. Hugo Vinicius and Lucas Pereira. Cataract detection through images using Convolutional Neural Networks. 2020.
12. Guilherme Gurgel and Jorge Luiz. Identification and reading of license plates in the Mercosur pattern using convolutional neural networks. 2020.
13. Rodrigo Figueiredo Barbosa. Recognition of facial expressions using a convolutional neural network. 2021.
14. Maurício Sena da Cruz and Wilton Oliveira Júnior. The use of data augmentation as a technique for improving neural networks to detect fake news about COVID-19. 2021.
15. Gabriel Barreto da Silva Costa and Victor Dias dos Santos. Electrical energy management system in computer labs. 2021.

## PUBLICATIONS

During my postdoc, I published the paper [1] and I'm in process of submitting [2]. During my PhD, I published the papers [3, 4]. Other research conducted: [5], [6], [7], [8].

## References

- [1] A. B. V. Wyzykowski and A. K. Jain, "Synthetic latent fingerprint generator," in 2023 IEEE/CVF Winter Conference on Applications of Computer Vision (WACV). Los Alamitos, CA, USA: IEEE Computer Society, jan 2023, pp. 971–980. [Online]. Available: <https://doi.ieeecomputersociety.org/10.1109/WACV56688.2023.00103>
- [2] —, "A universal latent fingerprint enhancer using transformer," in IEEE International Joint Conference on Biometrics (IJCB 2023). Ljubljana, Slovenia: IEEE Computer Society, jan 2023.
- [3] A. B. V. Wyzykowski, M. P. Segundo, and R. de Paula Lemes, "Level three synthetic fingerprint generation," in 2020 25th International Conference on Pattern Recognition (ICPR). IEEE, 2021, pp. 9250–9257.
- [4] —, "Multiresolution synthetic fingerprint generation," in IET Biometrics (under revision), 2021.
- [5] A. Wyzykowski, J. Marchi, and P. Mafra, "Rho-affine-orb : An improved orb algorithm for fully affine invariant matching," in The 32nd International Conference on Computers and Their Applications, 2017.
- [6] A. Gaete, F. J. Gutierrez, S. F. Ochoa, P. Guerrero, and A. Wyzykowski, "Visitrack: A pervasive service for monitoring the social activity of older adults living at home," in International Conference on Ubiquitous Computing and Ambient Intelligence. Springer, 2017, pp. 520–530.
- [7] A. B. V. Wyzykowski, E. Comunello, and A. C. Sobieranski, "Reconhecimento de células reprodutoras masculinas em imagens de microscopia sem lentes," 2017.
- [8] W. O. Júnior, M. S. da Cruz, A. B. V. Wyzykowski, and A. B. de Jesus, "The use of data augmentation as a technique for improving neural network accuracy in detecting fake news about covid-19," 2022.