WILLIAM NIEMIEC

PH.D. STUDENT | SOFTWARE ENGINEERING IN HEALTHCARE

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William Niemiec is a Ph.D student at the Institute of Informatics of the Federal University of Rio Grande do Sul (UFRGS) since 2024. He also works as a project manager, team lead, and senior software developer for a software house in Brazil. He has managed several projects, along with the development of several systems, including back-end, front-end, and mobile. In parallel, he has been researching software engineering in healthcare since 2021, attending health conferences, and organizing workshops with healthcare professionals. He also has research interests in Software Engineering, Component-Based Software Engineering, Model-Driven Development, and Artificial Intelligence applied in healthcare.

FORMAL EDUCATION

Ph.D. in Computer Science | *Federal University of Rio Grande do Sul* **2024 - Present**
Methodology for Defining a Computing Model for the Healthcare Field

Bachelor of Computer Science | *Federal University of Rio Grande do Sul* **Aug 2018 - Oct 2022**
Takere: a no-code platform for the development of mHealth applications based on care plans

PUBLISHED PAPERS

IEEE International Symposium on Computer-Based Medical Systems (CBMS) **2025**
Leveraging Natural Language Processing for mHealth Development: A Component-Based Approach Using Nursing Taxonomies

Journal of Systems and Software (JSS) **2025**
Towards a component-based framework for mHealth apps: Bridging the gap between the nursing domain language and the computation domain

Brazilian Symposium on Computing Applied to Health (SBCAS) **2025**
Avaliando a qualidade de aplicativos de saúde através da metodologia uMARS e do uso de personas

Brazilian Symposium on Software Engineering (SBES) **2022**
Mobilex: a generic framework for cross-platform mobile development based on web language

Workshop on the Implications of Computing in Society (WICS) **2022**
Artificial intelligence discrimination: How to deal with it?

Brazilian Symposium on Software Engineering (SBES) **2021**
ExecutionFlow: a tool to compute test paths of Java methods and constructors

PEER REVIEWER WORKS

1st Regional School of Machine Learning and Artificial Intelligence of the Southern Region **2025**
Porto Alegre, Rio Grande do Sul, Brazil

Xth Workshop on Scientific Initiation in Information Technology and Human Language **2025**
Fortaleza, Ceará, Brazil

LANGUAGES

- **English:** Advanced
- **Spanish:** Intermediate
- **Portuguese:** Fluent

HONORS

International Young Scientist Awards **2025**
Issued by ScienceFather

Young Researcher Award **2022**
Issued by the Federal University of Rio Grande do Sul

ACADEMIC WORKS

Federal University of Rio Grande do Sul | Teaching Practice **Oct 2024 – Jun 2025**

My responsibilities included teaching classes, managing a Moodle platform, and assisting the primary professor. This experience improved my ability to explain complex technical concepts clearly and effectively.

Federal University of Rio Grande do Sul | Research assistant **Feb 2020 – Oct 2022**

My early career included foundational roles in scientific research, focusing on full-stack development for a no-code health platform and work in data science and machine learning.

RESEARCH PROJECTS

Automation of clinical instrument generation through prompt engineering **2025 – Present**

This research project aims to explore the feasibility and effectiveness of using Artificial Intelligence (AI) to automate the creation of digital clinical instruments on the Otus Solutions platform. Otus, a company born from the experience of the renowned Longitudinal Study of Adult Health (ELSA-Brasil), offers an integrated solution to simplify and optimize clinical research. Currently, the instantiation of instruments on its platform, 'Otus Studio', is a manual and time-consuming process. The methodology includes a literature review, the iterative development and testing of prompts, the comparison of AI models, and the encapsulation of the best-performing model into an API (Application Programming Interface). The project includes a two-phase validation process: an internal validation, conducted by the partner company's team, and an external validation, with healthcare professionals and clinical researchers. It is expected that the automation will significantly reduce the time required to create the instruments, optimizing researchers' workflow and reducing the technical barrier to the digitalization of clinical instruments.

No-code platform for mHealth applications **2023 – Present**

The overall goal of this project is to identify a domain-specific language and specify basic building blocks for defining customizable healthcare plans, and to develop a no-code platform so that healthcare professionals can act as citizen developers and create applications to support medium/long-term health treatments. The platform will be built upon the essential elements of health treatments that can be interconnected to create individual care plans. The proposed platform is classified as no-code because it must provide a user-friendly interface in the language of the healthcare professional (HCP), without requiring any knowledge of programming logic to be used.

Using mobile applications for health monitoring/management **2023 – 2025**

Interaction with healthcare teams and volunteers to understand the use of mHealth in practice and identify essential elements of health treatments that can be translated into interconnectable computational elements for the creation of care plans.

ACADEMIC ADVISORY

Course Conclusion Paper | Federal University of Rio Grande do Sul **Mar. 2025 - Present**
Yasmin Beer. Gamification of mHealth applications.

Course Conclusion Paper | Federal University of Rio Grande do Sul **Nov. 2024 - Present**
Marlize Batista. Generation of tests from care plans.

Course Conclusion Paper | Federal University of Rio Grande do Sul **Nov. 2024 - Present**
Leonardo Vianna. Prompt Engineering with Takere platform components.

Research Assistant | Federal University of Rio Grande do Sul **Sep. 2024 - Present**
Cauã Thiago Duarte Miranda. Automation of research instruments.

Course Conclusion Paper | Federal University of Rio Grande do Sul **Jan. 2023 - Jan. 2024**
Renato Araujo Silveira. Evolving the Takere platform for a closer alignment with the language of a healthcare team.

COMPLEMENTARY EDUCATION

Conflicts of Interest **2024**
CITI Program

Data or Specimens Only Research **2024**
CITI Program

Google Cloud Computing Foundations ACADEMY **2022**
Google

Agile Development with Design Patterns **2022**
Coursera

ReactJS **2021**
B7Web

React Native **2021**
B7Web

Spring Boot, Hibernate, Rest, Ionic, JWT, S3, MySql, MongoDB **2021**
Udemy

C# Object Oriented Programming + Projects **2021**
Udemy

Machine Learning and Data Science with Python from A to Z **2020**
Udemy

Object-Oriented PHP **2021**
B7Web

MySQL Database **2020**
B7Web

Object-Oriented with Java **2020**
Coursera

HTML5, CSS3, and JavaScript **2020**
B7Web

PARTICIPATION IN EVENTS

IEEE 38th International Symposium on Computer-Based Medical Systems (CBMS) **2025**
Symposium

Brazilian Symposium on Computing Applied to Health (SBCAS) **2025**
Symposium

Future & Innovation Health Forum **2025**
Meeting

Digital Health Forum: Data and AI. **2025**
Meeting

Health Meeting **2024**
Fair

Brazilian Symposium on Software Engineering (SBES) **2022**
Symposium

Workshop on the Implications of Computing in Society (WICS) **2022**
Workshop

Brazilian Symposium on Software Engineering (SBES) **2021**
Symposium