Rudy Matela

Computer Scientist

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Personal Information

Full name	Rudy Matela Braquehais		
Nationalities	Brazilian & Polish (EU)	Year of Birth	1987

Summary

I am a Computer Scientist with over 10 years of experience divided between academia and the software industry. In industry, I worked developing web applications, mobile applications and embedded networking systems. I am a Deputy Assistant Professor at Jönköpings Tekniska Högskola (JTH), where I teach first year courses and research on property-based testing.

Education

2014–2017	**PhD in Computer Science**, *University of York*, United Kingdom.
2009–2011	**Master of Computer Science**, *Universidade Estadual do Ceará*, Brazil.
2005–2009	**Bachelor of Computer Science**, *Universidade Estadual do Ceará*, Brazil.

Skills and approximate years of experience

Programming	Haskell (>10 years), C (>10 years), Bash (>10 years), Ruby (3 years), C#, JavaScript, Lisp, Java, Assembly, C++, Python
Markup/Other	LaTeX (>10 years), HTML/CSS (>10 years), Makefile (>10 years), SQL
OS	Linux System Administration (Ubuntu, Debian, Arch): dpkg, apt, pacman
SCM	Git (>10 years), Mercurial (>10 years), SVN (3 years)
CI/CD	(>10 years) including: GitHub actions, Travis, CircleCI, Jenkins, Custom
Soft Skills	Problem Solving, Teamwork, Writing, Critical Thinking, Metacognition
Fields of Interest	Functional Programming Languages, Property-based Testing, Data Structures, Programming, Program Synthesis, Algorithm Design, Computer Networking

Languages

English	Fluent (C2)	Polish	Intermediate (B1)
Portuguese	Native Language (C2)	Swedish	Basic (A2)

Recent Roles and Experience (since 2008)

2022–2023 **Deputy Assistant Professor**, *Tekniska Högskolan i Jönköping*, Sweden. ju.se

Teaching: Programming, Functional Programming, Software Engineering, Data Structures and Algorithms.
Research: Property-based testing of AI and machine learning systems.

2022 **Software Engineer**, *Channable*, Netherlands. channable.com

Web backend development in Haskell.

2018–2021 **Computer Scientist**, *Self-employed*, Brazil.

Independent contractor providing software development services.

- Technologies: Haskell, Yesod, Snap, SQL, JavaScript and Bash;
- with **Stack Builders (USA)** from 2018 to 2020.

(Also) Independent research on functional programming:

- manipulation of dynamically typed expressions; matela.com.br/express.pdf
- program synthesis. github.com/rudymatela/conjure

2014–2017 **PhD Student**, *University of York*, United Kingdom. cs.york.ac.uk

Research on the field of property-based testing (in Haskell) under supervision of Colin Runciman. matela.com.br/thesis-rudy.pdf
During my PhD, I have worked on several occasions as a teaching assistant for a few courses.

2012–2013 **Project Manager (Software Development)**, *FFIT*, Brazil. ffit.com.br

Development of web and mobile applications in the field of health care.

- Technologies: Ruby on Rails, Android, Kannel SMS Gateway and C.
- Management of a small development team using agile methodologies (Scrum).
- Version control with Git and Mercurial; CI with Jenkins

2012 **Lecturer**, *Faculdade Lourenço Filho*, Brazil. flf.edu.br

Fixed-term lecturing in the Computer Networks Technologist Undergraduate Course.
Module: Network Services and Application Protocols

2011–2012 **Software Developer**, *Atlântico Institute*, Brazil. atlantico.com.br

Development of a printer driver to interface with Windows Azure using C++

- Technologies: C++, C#, WDK, DDK, Windows Azure.

2009 **Lecturer**, *Universidade Estadual do Ceará*, Brazil. www.uece.br

Fixed-term lecturing for the Introduction to Informatics module (distance learning).

2008–2010 **Software Developer and Project Manager**, *IEPRO*, Brazil. iepro.org.br

Implementation of network protocols in a programable switch platform.

- Technologies: C, Assembly (EZchip NP-3), SVN, Git, Linux
- Lead Programmer in 2008
- Project Manager from 2009 to 2010 using agile methodologies

Open Source Contributions — Software Portfolio

2015–now LeanCheck: an enumerative property-based testing library for Haskell
github.com/rudymatela/leancheck

2021–now Conjure: a tool that synthesizes Haskell functions out of argument-result bindings
github.com/rudymatela/conjure

2017–now Extrapolate: a library to generalize counter-examples of Haskell test properties
github.com/rudymatela/extrapolate

2016–now Speculate: a tool to discover properties about Haskell functions
github.com/rudymatela/speculate

2015–now FitSpec: a tool to refine test properties for Haskell programs
github.com/rudymatela/fitspec

2019–now Express: a library to manipulate dynamically-typed expressions for Haskell
github.com/rudymatela/express

2020–now Udge: an online judge for hosting programming problems and exercises
github.com/rudymatela/udge

2017 Tankode: a programming action game github.com/rudymatela/tankode

2007–now Maintainer of several Arch Linux packages on the AUR aur.archlinux.org

2012–2015 evenmoreutils: a collection of command line tools implemented in C and Bash
github.com/rudymatela/evenmoreutils

2013 BitBurn: a burndown chart generator that feeds from BitBucket issue trackers (implemented in Ruby). bitbucket.org/ffit/bitburn

2014–2021 Haskell Cheat Sheet matela.com.br/haskell-cs.pdf

Bugfixes and improvements

2012–2013 Bug fixes and improvements in the Hgactivity plugin for Mercurial
labs.freehackers.org/projects/hgactivity

2012 Bug fixes on the Kannel SMS Gateway kannel.org

2011 Bug fix on the screen rotation support of DWM dwm.suckless.org

2009 Commits in the Linux Kernel regarding documentation and code conventions

Selected Recent Publications

Haskell'21 Express: Applications of Dynamically Typed Haskell Expressions
matela.com.br/express.pdf

PhD Thesis 2017. Tools for Discovery, Refinement and Generalization of Functional Properties by Enumerative Testing. University of York, UK.
matela.com.br/thesis-rudy.pdf

IFL 2017 Extrapolate: generalizing counterexamples of functional test properties. Co-author: Colin Runciman. matela.com.br/extrapolate.pdf

Haskell'17 Speculate: discovering conditional equations and inequalities about black-box functions by reasoning from test results. Co-author: Colin Runciman.
matela.com.br/speculate.pdf

Haskell'16 FitSpec: refining property sets for functional testing. Co-author: Colin Runciman. matela.com.br/fitspec.pdf

Selected research projects

2023–now **Researcher**, Predictive maintenance using confidence predictors (PREMA-COP). Principal Investigator (PI): Tuwe Löfström

2014–2017 **PhD scholarship** from CAPES, Ministry of Education of Brazil: "Property-based testing of functional programs" later "Tools for Discovery, Refinement and Generalization of Functional Properties by Enumerative Testing"

Committee, reviewer and other roles

2023 **Team Coach** (JU), Nordic Collegiage Programming Contest (NCPC 2023)
nordic.icpc.io/ncpc2023

2022 **Program Committee Member**, Haskell Symposium 2022
www.haskell.org/haskell-symposium/2022

2020 **Reviewer**, WFLP 2020 (Int. Workshop on Functional and Logic Programming)
helm.cs.unibo.it/wflp2020

2016 **Reviewer**, Journal of Functional Programming (JFP)
www.cambridge.org/core/journals/journal-of-functional-programming