Jean-Baptiste Minani, Ph.D

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Education

May 2025	🔖 **Ph.D. Studies, Concordia University, Montreal, QC, Canada** in Software Engineering, IoT Systems Testing.
Dec 2009	🔖 **Master Studies, Carnegie Mellon University, Pittsburgh, PA, USA** in Information Technology-Mobility.
May 2006	🔖 **Bachelor Studies, Vellore Institute of Technology, Tamil Nadu, India** in Information Technology.

Experience

Industry Experience

2017 – 2021	🔖 **Software Team Leader, AOS LTD, Rwanda.** Projects: e-government digitalization, Smart Administration, National Prosecution System, and Project Management System.
2014 – 2017	🔖 **Software Team Leader, RDB, Rwanda.** Projects: Document Tracking and Workflow Management System, Integrated Electronic Case Management System, Business and Mortgage Registration, and the Government Command Center.
2010 – 2014	🔖 **Software Quality Assurance and Testing Engineer, Rwanda Development Board, Rwanda.** Led quality assurance and user acceptance testing for government solutions.
2008 – 2010	🔖 **Software Developer, Rwanda Information Technology Authority, Rwanda.** Developed in-house tools and contributed to quality assurance for government IT systems.
2017 – 2022	🔖 **Part-time Software Tester, Rwanda.** Projects: National Product Registration System, National Skills Database, Gender Management Information System for UNDP, and Citizen Participation in Planning and Budgeting for GIZ.
2009 – 2009	🔖 **System Engineer Intern, Bosch LLC, Palo Alto, CA (USA).** Developed a prototype wireless sensor network (WAN) for health monitoring.
	🔖 **Software Engineer Intern, Palo Alto Research Center (PARC), Palo Alto, CA (USA).** Developed a prototype network monitoring tool.

Academic Experience

2021 –2024	🔖 **Teaching Assistant, Concordia University, Canada.** Assisting professors for Introduction to Software Engineering and Software Design Methodologies (SOEN6461). **Reviewer.** Reviewing scientific articles in the software engineering field for top journals such as TSE, EMSE, JSS, IST, IoT Journal, Internet of Things, and conferences. **Blogs Writer**. Writing blogs regularly for software engineering topics.
2010 – 2021	🔖 **Lecturer, Adventist University of Central Africa, Rwanda.** Teaching Database Programming, System Analysis and Design, Introduction to Software Engineering, Software Testing, Programming: C, C#, Java Fundamentals, Data Introduction to Data Structures using C, Database Management System (DBMS), and supervising undergraduate students' projects, Curriculum Development for various courses.
2012 –2012	🔖 **Teaching Assistant, Carnegie Mellon University Africa, Rwanda.** Assisted with practical assignments in Java and C, mobile app development, and graded programming assignments and projects.

Experience (continued)

2007 – 2008   🔖 **Part-time Instructor, ISIG-Goma, RDC.** Instructed courses on .NET App development and Oracle Database.

2006 – 2008   🔖 **Teaching Assistant, Kigali Institution of Science and Technology, Rwanda.** Instructed courses on Database, C Programming, and System Analysis and Design.

Research Publications

Journal Articles

1. K. Mahmood, G. Rasool, J. B. Minani, F. Sabir, Y.-G. Guéhéneuc, and F. Jaffar, "Exploring the Impacts of Antipatterns on Object-Oriented, Service-Oriented, and Mobile-Oriented Systems," *Software: Practice and Experience*, 2025, Under revision.

2. J. B. Minani, Y. E. Fellah, F. Sabir, *et al.*, "IoT systems testing: Taxonomy, empirical findings, and recommendations," *Journal of Systems and Software*, p. 112 408, 2025, ISSN: 0164-1212. 🔗 DOI: https://doi.org/10.1016/j.jss.2025.112408.

3. J. B. Minani, N. Moha, Y.-G. Guéhéneuc, and F. Sabir, "FUNEETIS: Approach for Functional End-to-End Testing of IoT Systems," *ACM Transactions on Software Engineering and Methodology (TOSEM)*, 2025.

4. J. B. Minani, N. Moha, Y.-G. Guéhéneuc, and F. Sabir, "TISSEA: A Framework for Testing IoT Systems Based on Technical Software Engineering Aspects," *IEEE Internet of Things Journal*, 2025.

5. I. Trabelsi, B. Mahmoudi, J. B. Minani, N. Moha, and Y.-G. Guéhéneuc, "A Systematic Literature Review of Machine Learning Approaches for Migrating Monolithic Systems to Microservices," *IEEE Transactions on Software Engineering*, 2025, Under revision.

6. M. Kuradusenge, E. Hitimana, J. B. Minani, *et al.*, "A Framework for Monitoring the Effectiveness of Ecosystem-Based Adaptation Strategies Using Internet of Things and Machine Learning Techniques," *Journal of Environmental & Earth Sciences*, vol. 6, no. 3, pp. 197–216, 2024.

7. J. B. Minani, F. Sabir, N. Moha, and Y.-G. Guéhéneuc, "A Systematic Review of IoT Systems Testing: Objectives, Approaches, Tools, and Challenges," *IEEE Transactions on Software Engineering*, vol. 50, no. 4, pp. 785–815, 2024. 🔗 DOI: {10.1109/TSE.2024.3363611}.

8. J. B. Minani, E. F. Yahia, T. Imen, N. Moha, and Y.-G. Guéhéneuc, "TGenAI: LLM-based Approach for Functional Test Cases Generation for IoT System," *Under revision, Information and Software Technology (IST)*, 2024.

9. K. Nour, J. B. Minani, F. Sabir, N. Moha, and Y.-G. Guéhéneuc, "A Systematic Literature Review of IoT System Architectural Styles and their Quality Requirements," *IEEE Internet of Things Journal*, 2024.

10. J. B. Minani, F. Sabir, N. Moha, and Y.-G. Guéhéneuc, "A Multi-Method Study of Internet of Things Systems Testing in Industry," *IEEE Internet of Things Journal*, pp. 1–1, 2023. 🔗 DOI: 10.1109/JIOT.2023.3291233.

Conference Proceedings

1. Z. Chenail-Larcher, J. B. Minani, and N. Moha, "Test Generation from Use Case Specifications for IoT Systems: Custom, LLM-Based, and Hybrid Approaches," in *Proceedings of the 18th IEEE International Conference on Software Testing, Verification and Validation (ICST)*, Naples, Italy: IEEE, 2025.

2. J. B. Minani, F. Sabir, Y. El Fellah, and N. Moha, "Practical guidance for IoT systems testing: A taxonomy," in *Proceedings of the ACM/IEEE 6th International Workshop on Software Engineering Research & Practices for the Internet of Things*, 2024, pp. 57–64.

3 J. B. Minani, F. Sabir, Y. El Fellah, and N. Moha, "Towards an automated approach for testing IoT devices," in *Proceedings of the ACM/IEEE 6th International Workshop on Software Engineering Research & Practices for the Internet of Things*, 2024, pp. 22–29.

4 J. B. Minani, E. F. Yahia, A. Sanam, F. Sabir, N. Moha, and Y.-G. Guéhéneuc, "An Exploratory Study on Code Quality, Testing, Data Accuracy, and Practical Use Cases of IoT Wearables," in *IEEE Xplore (Status: Accepted but not yet online)*, 2024.

5 M. Kuradusenge, S. Kumaran, M. Zennaro, and J. B. Minani, "Risks Reduction of Rainfall-Induced Landslides-A Site-Specific Early Warning System (SSEWS)," in *ICT Systems and Sustainability: Proceedings of ICT4SD 2021, Volume 1*, Springer, 2022, pp. 873–881.

Skills

Project Management	PMP-certified with expertise in managing complex software projects.
Enterprise Architecture	TOGAF-certified Enterprise Architect with experience in system design and integration.
Programming Languages	C, Python, Java (with professional certificate), C#, PHP, NodeJS.
Frameworks	SpringBoot, Thymeleaf, JSP, Razor for ASP.NET MVC (MCTS on .NET Framework).
Databases	MySQL, Oracle, Microsoft SQL Server, MongoDB.
IDE	Eclipse, NetBeans, XCode, Android Studio, IntelliJ IDEA.
System Integrations	Expertise in REST API development and integration.
Version Control	Git, SVN for repository management.
Modelling Tools	Enterprise Architect, Visual Paradigm for system analysis and design.
LaTeX	Proficient in LaTeX for producing scientific papers, including complex document structures, references, tables, and equations.

Professional Certifications

PMP	Project Management Professional from PMI.
SQL-MySQL	SQL-MySQL for Data Analytics and Business Intelligence, Udemy (Online).
MCTS	Microsoft Certified Technology Specialist (MCTS), .NET Framework 4.
Oracle Java	Oracle Certified Java Professional.
TOGAF	TOGAF 9 and Advanced Enterprise Architecture.
Oracle DBA	Oracle Certified Database Administrator.
Android	Certified in Android Programming.
Microsoft SQL Server	Microsoft Data Platform using SQL Server.

Languages

English	Speaking (Fluent), Writing (Fluent), Reading (Fluent), Listening (Fluent).
French	Speaking (Intermediate), Writing (Intermediate), Reading (Intermediate), Listening (Intermediate).

Miscellaneous

2002 & 2008   🔖 **Scholarship Awards.** Awarded full scholarships to fully cover my undergraduate and Master's studies.

2004-2006   🔖 **Outstanding Student Performance Award.** Vellore Institute of Technology, India.