Alexander Schilling

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Summary

Machine learning researcher and software engineer with over 10 years of development experience across scientific computing, mobile applications, web systems, and data-intensive research. PhD candidate working on proton therapy range verification using Python, PyTorch, Monte Carlo simulation, and detector data. Experienced university lecturer and technical team lead.

Work Experience

PHD CANDIDATE | APRIL 2021–PRESENT

University of Applied Sciences Worms, Germany & RPTU University Kaiserslautern-Landau, Germany

- Conduct research on in situ proton therapy range verification using machine learning with Python, scikit-learn, and PyTorch.
- Develop an extensive GATE/Geant4-based Monte Carlo simulation framework for particle therapy and proton computed tomography.
- Apply data science and analytics techniques to extract insights and drive decision-making, including advanced data visualization.
- Teach the foundations of machine learning in lectures and practical exercises.

SOFTWARE DEVELOPER | JUNE 2019–MARCH 2021

TST IT Management GmbH, Worms, Germany

- Developed Windows-based scanner software with C# .NET Compact Framework.
- Designed and developed an Android-based scanner software with C# and Xamarin.
- Developed an SQL Server backend for a warehouse management system with T-SQL.
- Supported 24/7 warehouse-management operations as part of an on-call rotation.
- Supervised interns and onboarded new developers.

TECHNICAL CONSULTANT | FEBRUARY 2017–MAY 2019

Bright Solutions GmbH, Darmstadt, Germany

- Implemented applications from supplied concepts and designs for iOS with Swift.
- Developed websites with PHP and Drupal.
- Advised customers on technical requirements and implementation decisions.

LEAD DEVELOPER AND CTO | MAY 2015–APRIL 2017

SpaceBoard, Le Kremlin-Bicêtre, France

- Led development of the platform using PHP and Symfony.
- Defined technical architecture and made key technology decisions.
- Recruited and onboarded developers.

SOFTWARE DEVELOPER | DECEMBER 2012–MARCH 2015

deVision coding GmbH, Offenbach, Germany

- Developed concepts for iOS applications.
- Implemented iOS applications using Objective-C and Swift.
- Presented project results and technical solutions to customers.

Education

TECHNICAL UNIVERSITY OF DARMSTADT, GERMANY | APRIL 2016–MAY 2019

Master of Science, Internet- and Web-based Systems

TECHNICAL UNIVERSITY OF DARMSTADT, GERMANY | OCTOBER 2012–MARCH 2016

Bachelor of Science, Computer Science

Teaching Experience

LECTURE WEEK NEXT GENERATION PARTICLE DETECTORS, 2024, UNIVERSITY OF BERGEN, NORWAY

- 5-day workshop, hands-on machine learning for physics applications

IGRAM LECTURE WEEK, 2023, UNIVERSITY OF BERGEN, NORWAY

- 5-day workshop, machine learning and clean code for physicists

LECTURE MACHINE LEARNING, UNIVERSITY OF APPLIED SCIENCES WORMS, GERMANY

- 4 semesters of lectures and practical exercises, 6 ECTS, foundations of machine learning

Publications

A. Schilling et al., Modeling charge collection in silicon pixel detectors for proton therapy applications. Biomedical Physics & Engineering Express 11, 2025, DOI: 10/p4gn

A. Schilling et al., Uncertainty-aware Spot Rejection Rate as Quality Metric for Proton Therapy Using a Digital Tracking Calorimeter. Physics in Medicine & Biology 68, 2023, DOI: 10/k29s

A. Schilling et al., Evaluation of a Digital Tracking Calorimeter for In-Situ Range Verification during Particle Therapy. IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC), Milan, Italy, 2022, DOI: 10/mjcx

Skills

Machine Learning & Data	Python, PyTorch, scikit-learn, pandas, NumPy, data visualization
Scientific Computing	C/C++, GATE/Geant4, Monte Carlo simulation
Software Development	C#/.NET, SQL Server, T-SQL, PHP, Swift, Java
Practices	Git, Docker, CI/CD, testing, clean code, Scrum, Linux-based systems
AI-assisted Work	LLM-assisted coding, agentic workflows, MCP integrations

Languages

GERMAN	Native
ENGLISH	Fluent (Cambridge Certificate in Advanced English)