MALEK CELLIER

SENIOR R&D SOFTWARE ENGINEER
DATA SCIENTIST

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French / Swedish

With a solid grounding in Linux, I thrive on crafting and architecting systems. I've developed an array of simulation tools across languages such as Python, OpenGL, C/C++, and MATLAB, all while implementing leading DevOps methodologies. My expertise in software engineering has continually deepened throughout the years and encompasses shell/Python scripting, web frontend/backend, network/socket programming, graphics card programming, multiprocessing/threading programming.

With over 20 years of R&D experience in the telecom industry focusing on Radio Resource Management, I have developed strong problem-solving skills and domain knowledge. I leverage these to design, implement, and evaluate algorithms resulting in better-performing products. My work in that area has resulted in publications, 3GPP contributions, IPRs and patents.

SKILLS: Python, C++, OpenGL, Test, DevOps, Docker, REST-API, AI/ML, MlOps, Raytracing, Linux, MATLAB, 3GPP, RRM, 3G, HSPA, 4G, LTE, 5G, NR, 5G+, RLC, MAC, Packet Scheduling, Modeling, Simulator Development, Link Budget, TCP/IP.

EXPERIENCE

2021 - 2023 WIRELESS ALGORITHM SPECIALIST
Consultant at Huawei, Sweden

My role was to conduct applied research to solve issues and propose new algorithms across systems, e.g.:

- Implementation and evaluation of a joint Scheduling and Precoding design scheme in a 5G simulator. A DevOps chain was set up on GitLab.
- Implementation of an interference mitigation scheme through multiple RL agents
- Implementation of an interference mitigation scheme using Beam Frequency Reuse patterns (BFR). A DevOps chain was set up on GitLab.
- Design and implementation of an Inter Process Communication software to enable data exchange between a process running a C++ 5G simulator and one with a ML algorithm (TensorFlow) to allow live training. It uses C++ASIO (socket programming library) and multiprocessing. The solution has a server and clients for different platforms (MATLAB, Python, C). A DevOps chain was set up on GitLab.
- Design and implementation of a partial PyPi mirror to allow custom Python packages to be served within the company's network. Uses Flask, waitress, and REST-API. A DevOps chain was setup on GitLab.

Skills: *Linux, C++11, MATLAB, Python, Numpy, Pandas, matplotlib, Data analysis, RRC, MAC, MIMO, precoding, OpenGL, DevOps, Javascript, REST, PS, AI, socket, multiprocessing, Precoding, GitLab, ASIO, IPC, Flask, waitress*

2015 - 2021 WIRELESS SYSTEMS SPECIALIST
Consultant at Huawei, Sweden

My role was to conduct applied research to solve issues and propose new features and concepts for the LTE / 5G product lines, e.g.:

- Implement a holistic L2 scheduling scheme in NR with a Ray Traced channel model, including traffic generation, channel estimation
- Responsible for designing and implementing a GPU-accelerated 5G simulator (Python, OpenGL, JavaScript) that includes its own OpenGL renderer for the display of 3D scenes
- Evaluate the impact of mobility for Massive MIMO TDD users, using various precoding strategies
- Propose, design and evaluate a Mobility Load Balancing strategy in LTE-A using CIO (C++, protocol correct simulator)

Skills: *Linux, C++11, MATLAB, Python, Numpy, Pandas, matplotlib, Data analysis, RRC, MAC, MIMO, precoding, OpenGL, DevOps, Javascript, REST, raytracing, PS, AI, 3D renderer*

2014 - 2015 SYSTEM ANALYST
Consultant at Ericsson, Spain

My role was to provide internal requirements for web-based services, e.g.:

- Collaboration with several SCRUM teams across the world (India, Mexico, Croatia, Spain)
- Writing technical specifications for the development of a web-based monitoring and troubleshooting platform for cellular network operators (Orange, ATT)
- Taking responsibility for feature lifecycle, follow-up and bug triage

Skills: *Java, JavaScript, JIRA, Confluence, git*

2011 - 2014 WIRELESS SYSTEMS SPECIALIST
Consultant at Huawei, Sweden

My role was to conduct applied research to assist the HSUPA product line teams, e.g.:

- Design, implementation and evaluation of various CS-Fallback strategies in UMTS in MATLAB
- Evaluation of HetNet Mobility performance in HSUPA with a C++11 simulator
- Optimization of the RRC state transitions (DCH/FACH/PCH) and channel type selection in MATLAB
- Provide Packet scheduling enhancements for HSUPA in C++

Skills: *Linux, C++11, MATLAB, HSUPA, LTE, RRC, RLC, PS, Data analysis*

2008 - 2011 WIRELESS NETWORK SPECIALIST
Employee at Nokia Siemens Network, Denmark

My role was to conduct applied research to assist the LTE product line teams, e.g.:

- Evaluation of the impact of smartphone usage on the C-plane load at system level
- Design, implementation, and evaluation of a SON RRM algorithm for the LTE U-plane
- Design, implementation, and evaluation of Advanced Power Control for the LTE Uplink
- Supervision of Master Students & research assistants

Skills: *Linux, C++03, C++11, MATLAB, LTE, RRM, PS, Power Control, Data analysis*

2005 - 2008 WIRELESS NETWORK ENGINEER
Employee at Nokia Networks, Denmark

My role was to conduct applied research to assist the HSUPA product line teams, e.g.:

- Building a detailed excel-based link budget tool for HSUPA
- Design, implementation, test, and evaluation of various RRM algorithms (Soft Handover, Admission Control, Packet Scheduling, Power Control) in a proprietary HSPA system-level C++03 simulator
- Assessment of HSUPA system level performance with 16QAM & HARQ, and short TTI in C++03
- Investigation of QoS performance in Non-Scheduled Transmissions for UMTS in MATLAB
- Collaboration on HSUPA technical response to RFI from SPRINT USA to questions regarding RAN /RF domains
- Writing internal concept documents, conference, and journal papers
- Supervision of Master Students in Mobile Communications

Skills: *Linux, C++03, MATLAB, VBA, Excel, Modulation, PS, Coding, QoS, AC, PC*

2004 - 2005 PHD STUDENT
Employee at Aalborg University / Nokia Networks, Denmark

My role was to conduct research on RRM algorithms for HSUPA, e.g.:

- Design, implementation in C++03 and evaluation of a Packet Scheduling (PS) algorithm
- Analysis of Link Adaptation performance at system level with MATLAB
- Supervision of Master Students

Skills: *Linux, C++03, MATLAB, 3G, HSUPA, PS, Data analysis*

2003 - 2004 RESEARCH ASSISTANT
Employee at Aalborg University, Denmark

My role was to assist a PhD student in their research, e.g.:

- Implementation of subsets of the UMTS/3G PHY, MAC, RLC, PDCP protocol layers in C++03 in a WCDMA Emulator (RESPECT)
- Evaluation of impact of (emulated) RLC settings on end-to-end data transmission over a real TCP/IP network

Skills: *Linux, C++03, MATLAB, 3G, TCP/IP, Emulator, Simulator, Data analysis*

JOURNAL PAPERS

2010 "Enhancing Uplink Performance in UTRAN LTE networks by Load Adaptive Power Control"

CONFERENCE PAPERS

2017 "Multi-dimensional radio service maps for position-based self-organized networks"
2010 "Load Adaptive Power Control in LTE Uplink"
2008 "Interference Based Power Control in LTE Uplink"
2007 "Errors on the HSUPA E-HICH Channel and their Effect on System Performance"
2006 "High Speed Uplink Packet Access Evaluation by Dynamic Network Simulations"
2005 "The Impact of RLC delivery sequence on FTP performance in UMTS"
2005 "RESPECT: A real time emulator for service performance evaluation in cellular networks"
2005 "Emulation-based performance investigation of FTP file downloads over UMTS dedicated channels"

PATENTS

2018 "Client device, network access node and methods for efficient scheduling of data traffic", *WO2020064088A1, Huawei*
2008 "Apparatus, methods and computer program products providing estimation of activity factor and enhanced resource management", *Nokia, WO2008059361A2*
2007 "Resource control for scheduled and non-scheduled traffic", *Nokia, WO2007129186A1*

EDUCATION

2002-2003 M.Sc. in Mobile Communication, Exchange program
Aalborg University, Denmark
2000-2003 M.Sc. in EE, Major in Telecommunications
Ecole Centrale d'Electronique, Paris

KNOWLEDGE & SKILLS

ML/AI	NN, RL, Regression
CS	Linux, C/C++, Python, MATLAB, Octave, shell, OpenGL, QT, Tkinter, Git, REST-API, Docker, Podman, DevOps CI/CD, MlOps
Teamwork	GitLab, GitHub, Slack, SCRUM, Agile, Atlassian JIRA & Confluence
Database	SQL: MySQL, PostgreSQL / NoSQL: InfluxDB, MongoDB
Web	Apache, NGINX, Nodejs, html, CSS, JavaScript, webGL
Network	5G, LTE, HSPA, RRC, RLC, MAC, Massive MIMO, TCP/IP

LANGUAGES

English	Professional proficiency written and spoken
Swedish	Professional proficiency written and spoken
French	Native
Spanish	Professional proficiency written and spoken
Danish	Professional proficiency written and spoken
German	Intermediate (studied 4 years in high school)

EXTRA-CURRICULAR

Family	Father to a 7-year-old who plays football and ice-hockey
Real-Estate	Acquired, redesigned, and supervised the renovation of 4 apartments in the Caribbean Designed and renovated 2 different locals which I turn into Salsa Dance Schools
Dance	Ran 2 different Salsa Clubs Cuban Salsa / Bachata Instructor from 2008 until 2014 Volunteer in Salsa association DJ'ing Latin music
Music	Lead Guitarist in a Metal band until 2002