Marwan Abdellah *Résumé*

Senior Software Engineer · Biomedical Engineer · Scientific Visualization Expert · Neuroinformatician
Business Development · Art in Science

PERSONAL STATEMENT

About Me

A results-driven, proactive, and business-oriented Senior Software & Research Engineer with over 14 years of expertise in 3D modeling, large-scale visualization, physically based rendering, neuroinformatics, computational biology, medical imaging, and high-performance computing. Proven track record of translating business-driven ideas into scalable, efficient software solutions with significant impact in both academia and industry. Collaborating with cross-functional teams across diverse interdisciplinary domains. Holds a PhD in Neuroscience from the Blue Brain Project of the École Polytechnique Fédéral de Lausanne (EPFL), with the focus on simulating the mouse brain using supercomputers. AgilePM certified.

EXPERIENCE & EMPLOYMENT HISTORY

07.2011 – 12.2024	Senior Visualization Research Engineer (Current) · Blue Brain Project · EPFL · Geneva · Switzerland
01.2013 – 10.2013	Software Engineer · Coursera EPFL · Lausanne · Switzerland
03.2010 – 07.2010	Software Engineer (Visualization) · Biomedical Group · Symbyo Technologies (360imaging) · Cairo · Egypt
07.2009 – 07.2010	Instructor (Visualization & HPC) · National Institute of Laser Advanced Sciences (NILES) · Cairo · Egypt
09.2009 – 02.2010	Biomedical Software Engineer · International Biomedical Engineering (IBE) Technologies · Cairo · Egypt

EDUCATION

09.2012 — 09.2017	Ph.D. In Silico Neuroscience · Blue Brain Project · EPFL · Lausanne · Switzerland
09.2009 — 05.2012	M.Sc. Biomedical Engineering · Biomedical Engineering Department · Cairo University · Cairo · Egypt
09.2004 — 05.2009	B.Sc. Biomedical Engineering · Biomedical Engineering Department · Cairo University · Cairo · Egypt

INTERESTS

Visualization	Scientific visualization · Immersive visualization · VR · Distributed and scalable volume visualization
Rendering	Physically-based Monte Carlo volume rendering · Rendering highly scattering heterogeneous fluorescent media
Neuroinformatics	Neuronal, astroglial and vascular reconstruction, visualization and analysis
HPC	GPU computing (GPGPU) · Heterogeneous computing · Parallel and distributed computing
Geometry	Reconstruction of high fidelity watertight polygonal meshes
Medical Imaging	High performance real-time volume reconstruction of medical data (CT, MRI and US)

TECHNICAL

Software Process	Agile · Scrum · CI/CD · Jira · Git · GitLab · Doxygen
Github	github.com/marwan-abdellah
Programming	C/C++ 14, 17, 20 · Python · C# · Unix Shell · OOP · Design Patterns · TDD
Libraries	STL · Qt · Boost · HDF5 · Eigen · GLM
Visualization	Unreal Engine · Unity · OpenSceneGraph · OpenCV · VTK · OpenGL
3D	Blender (scripting with Python) · Maya (including MEL scripting) · 3DSMax
Rendering	PBRT · LuxRender · Mitsuba
HPC	CUDA · OpenCL · OpenMP · SLURM
Web Development	HTML · CSS · JavaScript
Scientific Packages	MATLAB · Octave
Design & Web	Gimp · Keynote · Inkscape
Typography	LaTeX· Microsoft Office

Proudly scripted with LaTeX · Updated November 9, 2024

SELECTED PROJECTS

2022 — Present — Effective Skeletonization of Neuronal-Glial-Vascular (NGV) Structures
Reconstruction of high quality morphological skeletons of neuroscientific models from segmented electron microscopy data including neurons, dendritic spines, astroglial cells and large scale vascular networks.

2018 — Present — Reconstruction of High Fidelity Polygonal Mesh Models of Neuroscientific Data
Reconstruction of accurate and watertight mesh models of neurons, glial cells and blood vessels from point clouds acquired from optical microscopes and non-watertight meshes or volumetric stacks obtained by optical and electron microscopy.

2013 — 2021 — Simulation of Optical Microscopy with Monte Carlo Rendering
Simulation of the imaging pipelines in multiple optical microscopy techniques including brightfield and light sheet fluorescence microscopy.

2016 — 2020 — Physically-plausible Reconstruction of Volumetric Models of Neuronal Morphologies
Automated reconstruction of optically aware volumetric models of cortical neuronal morphologies segmented with optical microscopes.

2015 — 2016 — Rendering of Large Scale Volumes on Distributed Heterogeneous Computing Platforms
OpenCL-based, parallel and distributed rendering engine for visualizing volumes on multi-GPU architectures.

SELECTED PRESENTATIONS

October 2023 — *Leveraging Blender to model and visualize the neuro-glia-vascular (NGV) ensemble*

MAJOR OPEN SOURCE CONTRIBUTIONS

2017 — Present — *Ultraliser**

2016 — Present — *NeuroMorphoVis** · *VessMorphoVis**

2015 — 2016 — *Livre*

2011 — 2012 — *Equalizer*

PERSONAL

Birth — *1987 · Egypt*
Residence — *Lausanne · Switzerland*
Work Address — *Campus Biotech · Chemin des Mines, 9 · Geneva · CH-1202 · Switzerland*
HomePage — *www.marwan-abdellah.com*
Email — *abdellah.marwan@gmail.com*
Languages — English — *Fluent* · French — *Very Good (B2)*
Italian · Spanish · German — *Learning*
Arabic — *Mother-tongue*

PROFILE

Publications — *All the publications and scientific contributions are available online at marwan-abdellah.com/publications.html.*
Recommendations — *Recommendations are available upon request.*
Full profile — *A detailed curriculum vitæ is available at marwan-abdellah.com/about.html.*

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