

Marwan Abdellah

Résumé

PERSONAL STATEMENT

About Me Motivated and business-oriented researcher & software engineer with solid experience in 3D modeling, large-scale visualization, physically based rendering, neuroinformatics, computational biology, medical imaging and high performance computing. This comes with a proven track record in innovating and adapting business-driven ideas and transferring them into efficient, maintainable and scalable software solutions with powerful applications in industry and academia with 14 years of experience. Working in collaboration with multiple cross-functional teams with diverse interdisciplinary backgrounds to converge to the most optimum solution. PhD in Neuroscience from the Blue Brain Project at the École Polytechnique Fédéral de Lausanne (EPFL) with ambitions to simulate the mouse brain on supercomputers. AgilePM certified.

EXPERIENCE & EMPLOYMENT HISTORY

07.2011 – Present 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
Computational Geometry Reconstruction of high fidelity watertight polygonal meshes
Medical Imaging High quality and high performance 3D/4D real-time volume reconstruction for medical data (CT, MRI and Ultrasound) · Digitally reconstructed radiograph generation with k-space volume rendering

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 · 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 L^AT_EX · Microsoft Office

SELECTED PROJECTS

- 2022 — Present **EFFECTIVE SKELETONIZATION OF NEURONAL-GLIAL-VASCULAR (NGV) STRUCTURES**
Reconstruction of high quality morphological skeletons of neuroscientific models from segmented data including neurons, 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 neuroscientific structures including neurons, glial cells and blood vessels from point clouds acquired from optical microscopes and non-watertight meshes or volumetric stacks obtained by electron microscopes.
- 2013 — 2021 **SIMULATION OF OPTICAL MICROSCOPY IMAGING WITH MONTE CARLO RENDERING**
Simulation of the imaging pipelines in multiple optical microscopy techniques including brightfield and light sheet fluorescence microscopy.
- 2016 — 2020 **OPTICALLY PLAUSIBLE RECONSTRUCTION OF VOLUMETRIC MODELS OF NEURONAL MORPHOLOGIES**
Automated reconstruction of accurate volumetric models of neocortical neuronal morphologies obtained from optical microscopes.
- 2015 — 2016 **PARALLEL RENDERING OF LARGE SCALE VOLUMES ON DISTRIBUTED HETEROGENEOUS COMPUTING PLATFORMS**
OpenCL-based, distributed rendering engine for visualizing large scale volumes on parallel multi-GPU remote machines.
- 2015 — 2017 **PHYSICALLY-BASED RENDERING OF HIGHLY SCATTERING FLUORESCENT BRAIN MODELS**
A novel rendering model for simulating light interaction with highly scattering fluorescent models based on a physically-plausible basis.

MAJOR OPEN SOURCE CONTRIBUTIONS

- 2017 — Present *Ultraliser**
- 2016 — Present *NeuroMorphoVis* · VessMorphoVis**
- 2015 — 2016 *Livre*
- 2011 — 2012 *Equalizer*

PROFESSIONAL ACTIVITIES

CERTIFICATION

09.2023 AGILEPM® FOUNDATION
APMG International

PROFESSIONAL MEMBERSHIPS

- 07.2023 — Present MEMBER
Venturelab
- 05.2015 — Present MEMBER
International Society for Computational Biology (ISCB)
- 04.2015 — Present MEMBER
The European Association of Computer Graphics (Eurographics)
- 01.2010 — Present MEMBER
Institute of Electrical and Electronic Engineers (IEEE)

01.2010 — Present **MEMBER**
IEEE Engineering in Medicine and Biology Society (EMBS)

02.2015 — Present **MEMBER**
IEEE Engineering Computer Society

PERSONAL

Residence *Crissier · Vaud · Switzerland - Permit C*

HomePage *www.marwan-abdellah.com*

Email *abdellah.marwan@gmail.com*

Languages *ENGLISH — Fluent · FRENCH — Very Good (B1 FIDE, B2 Berlitz) · ARABIC — Mother tongue*

Publications *All the publications are available at marwan-abdellah.com/publications.html.*

Recommendations *Recommendations are available upon request.*