Marwan Abdellah

Curriculum Vitæ

PERSONAL STATEMENT

Motivated, talented and innovative researcher and software engineer with a solid experience in three-dimensional modeling, visualization, physically-based rendering and high performance computing, all applied to computational biology and neuroscience. This comes with a proven track record in innovating and adapting research ideas and transferring them into efficient, scalable and open source software solutions with solid applications in industry and academia. More than 10 years of experience in scientific visualization as a researcher, three-dimensional media designer and software engineer. PhD in Neuroscience from the Blue Brain Project (EPFL) with ambitions to digitally reconstruct and simulate the mammalian brain.

EDUCATION

09.2012 — 09.2017

PH.D. · IN SILICO NEUROSCIENCE
Blue Brain Project · Neuroscience Doctoral School · École Polytechnique Fédéral de Lausanne (EPFL)
Lausanne · Switzerland
THESIS — *In Silico Brain Imaging*
RESEARCH SCOPE — *Bio-physically-based rendering and visualization of complex brain tissue models using computational modeling and simulation of optical microscopes.*
ADVISORS — *Henry Markram · Felix Schürmann*
MENTORS — *Ahmet Bilgili · Stefan Eilemann · Jean-Philippe Thiran*

09.2009 — 05.2012

M.SC. · BIOMEDICAL ENGINEERING
Systems & Biomedical Engineering Department · School of Engineering · Cairo University
Cairo · Egypt
THESIS — *High Performance Fourier Volume Rendering on Graphics Processing Units (GPUs)*
RESEARCH SCOPE — *Accelerating the generation of digitally-reconstructed radiographs (DRRs) on GPUs using Fourier slice theorem and frequency domain volume rendering.*
ADVISORS — *Ayman Eldeib · Amr Sharawi*

09.2004 — 05.2009

B.SC. · BIOMEDICAL ENGINEERING
Systems & Biomedical Engineering Department · School of Engineering · Cairo University
Cairo · Egypt
THESIS — *Software Development for Low Cost, High quality, Real-time, 4D Ultrasound on Personal Computers*
PROJECT SCOPE — *Investigating various rendering algorithms for accelerating 4D Ultrasound volume reconstruction on GPUs.*
ADVISOR — *Yasser Kadah*

EXPERIENCE & EMPLOYMENT HISTORY

07.2011 – Present

SCIENTIFIC VISUALIZATION ENGINEER · DOCTORAL ASSISTANT · POST-DOCTROAL FELLOW
Blue Brain Project · École Polytechnique Fédéral de Lausanne (EPFL)
Lausanne & Geneva · Switzerland
ROLE — *High performance and distributed visualization, automated visualization workflows, and multimedia generation for neuroscientific data.*
DIRECTOR — *Henry Markram* · PROJECT MANAGER & CO-DIRECTOR — *Felix Schürmann*
LEADS — *Stefan Eilemann · Samuel Lapere*

01.2013 – 10.2013

SOFTWARE ENGINEER
EPFL
Lausanne · Switzerland
ROLE — *Building automated grading and systematic evaluation workflows for C++ and JAVA courses offered by*

EPFL on Coursera.
Instructors — *Jean-Cédric Chappelier · Vincent Lepetit · Jamila Sam*

07.2010 – 04.2011   Research Intern
SCI-STI-MM Multimedia Group · École Polytechnique Fédéral de Lausanne (EPFL)
Lausanne · Switzerland
Role — *Pursuing a research on H.264 and re-configurable video coding.*
Lab Director — *Marco Mattavilli*

03.2010 – 07.2010   Associate Biomedical Software Engineer
Biomedical Group · Symbyo Technologies (360imaging)
Cairo · Egypt
Role — *Development of dental implant software.*

07.2009 – 07.2010   Instructor
National Institute of Laser Advanced Sciences (NILES) · Cairo University
Cairo · Egypt
Role — *Instructing different topics of visualization and high performance computing.*

09.2009 – 02.2010   Biomedical Software Engineer
Research and Development Team · International Biomedical Engineering (IBE) Technologies
Cairo · Egypt
Role — *Development of 4D ultrasound reconstruction software.*

01.2005 – 09.2010   Freelancer
Web design

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research & development interests

Visualization   *Scientific visualization · High performance, distributed, and scalable volume rendering · Transfer function design*

Rendering   *Physically-based Monte Carlo rendering · Rendering fluorescence materials with highly scattering heterogeneous media*

In Silico Neuroscience   *Physically-plausible simulation of different microscopic imaging techniques of the cortical brain tissue using digital reconstructions of 3D neuronal models including brightfield, fluorescence and light sheet microscopes*

HPC   *GPU computing (GPGPU) with CUDA · Heterogeneous computing with OpenCL · Parallel and distributed computing with OpenMP and sockets*

Computational Geometry   *Reconstruction of high fidelity polygonal meshes that can accurately represent the surface of neuronal morphologies extracted from optical microscopy stacks*

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*

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selected projects

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.

2016 — Present   Physically-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 — 2016   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.

2013 — Present   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.

OPEN SOURCE CONTRIBUTIONS

2019 — Present   VESSMORPHOVIS
A Blender-based add-on for visual analysis of digital reconstructions of blood vessels morphological skeletons. The add-on is used to visualize, analyze large scale vasculature graphs and create polygonal meshes and high quality renderings using Cycles.

2016 — Present   NEUROMORPHOVIS
An interactive, extensible and cross-platform framework for building, visualizing and analyzing digital reconstructions of neuronal morphology skeletons extracted from microscopy stacks. The framework is capable of detecting, repairing tracing artifacts and generating high fidelity surface meshes and high resolution volumetric models for simulation and in silico imaging studies.

2015 — 2016   LIVRE
Large scale interactive parallel volume rendering engine.

2011 — 2015   THE NEOCORTICAL MICROCIRCUIT COLLABORATION PORTAL
This portal provides an online public resource of the Blue Brain Project's first release of a digital reconstruction of the microcircuitry of juvenile Rat somatosensory cortex, access to experimental data sets used in the reconstruction, and the resulting models.

2011 — 2012   EQUALIZER
Equalizer is the standard middleware to create and deploy parallel OpenGL-based applications.

2012   THE PORTABLE HARDWARE LOCALITY (HWLOC)
This software package provides a portable abstraction of the hierarchical topology of modern architectures, including NUMA memory nodes, sockets, shared caches, cores and simultaneous multithreading.

HONORS & AWARDS

September 2019   KEN BRODLIE PRIZE · EUROGRAPHICS UK CHAPTER
Best Paper Award at CGVC 2019 · Generating High Fidelity Surface Meshes of Neocortical Neurons using Skin Modifiers

August 2019   PEOPLE'S CHOICE AWARD FROM NEUROART MBF NEUROSCIENCE
USD 250.0 · The Neocortical Network

July 2019   INTERNATIONAL SOCIETY FOR COMPUTATIONAL BIOLOGY (ISCB) AWARD
Inside the Neocortex - ISCB Art in Science Competition · Honorable Mention.

July 2018   INTERNATIONAL SOCIETY FOR COMPUTATIONAL BIOLOGY (ISCB) AWARD
In Silico Brainbow - ISCB Art in Science Competition · Third Place.

October 2017   ÉCOLE POLYTECHNIQUE FÉDÉRAL DE LAUSANNE (EPFL) PRIME SPECIALE

1000.0 CHF

January 2010	**ITIDA GRADUATION PROJECT AWARD** *My graduation project was awarded the first place in 2009 from the Minsters of Higher Education and Tele-Communication in Egypt during a celebration that was organized by ITIDA.*
June 2010	**NVIDIA AWARD · ICTP SUMMER SCHOOL ON HPC AND GRID COMPUTING** *NVIDIA GeForce GTX 9800 GPU awarded as a prize for accelerating ultrasound volume rendering application in ICTP.*
July 2009	**DISTINCTION WITH HONOR · B.SC. BIOMEDICAL ENGINEERING** *Systems & Biomedical Engineering Department · Faculty of Engineering · Cairo University*

GRANTS & FELLOWSHIPS

June 2018	**ISMB FELLOWSHIP** *Travel award of USD 1000 to attend the Conference on Intelligent Systems for Molecular Biology (ISMB) in Chicago, USA.*
September 2012	**PH.D. FELLOWSHIP** *Fully funded Ph.D. fellowship from the Blue Brain Project · École Polytechnique Fédéral de Lausanne (EPFL)*
January 2011	**ICTP GRANT** *Travel award to attend the Advanced Workshop in High Performance Computing & Grid Computing in the International Center for Theoretical Physics (ICTP) in Trieste, Italy.*
August 2009	**ICTP GRANT** *Travel award to attend the Advanced Workshop in High Performance Computing in the International Center for Theoretical Physics (ICTP) in Trieste, Italy.*
January 2009	**ITIDA/ITAC GRANT** *Grant of USD 2000 from ITAC to support my graduation project.*

TECHNICAL

Programming	*C/C++ · Python · Unix Shell · OOP · Design Patterns · TDD*
Libraries	*STL · Boost · Qt*
Visualization & CG	*OpenGL · Open Inventor · OpenSceneGraph · VTK · XIP · NVIDIA Cg · GLSL*
Rendering	*PBRT · LuxRender · Mitsuba*
HPC	*CUDA · OpenCL · OpenMP · SLURM*
Web Development	*HTML · CSS · JavaScript · React*
Software Process	*Agile · Scrum · Bamboo · Jira · Jenkins*
Scientific Packages	*MATLAB · Octave · Vensim*
3D Graphics	*Blender (scripting with Python) · Maya (including MEL scripting) · 3DSMax*
Design & Web	*Gimp · Adobe Photoshop · Adobe Illustrator · Adobe After Effects · Adobe Muse*
Typography	*LATEX· Lyx · Microsoft Office*
Others	*Git · SVN · Doxygen*

PROFESSIONAL ACTIVITIES

PROFESSIONAL MEMBERSHIPS

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

04.2015 — Present   MEMBER
The European Association of Computer Graphics (Eurographics)

05.2015 — Present   MEMBER
International Society for Computational Biology (ISCB)

CLASSES & TEACHING

Spring 2014
Spring 2013   NUMERICAL ANALYSIS · MATH–251
Life Sciences School · 4th Bachelor semester
École Polytechnique Fédéral de Lausanne (EPFL)
TOPICS — *Stability, condition number and convergence of numerical methods · Polynomial interpolation and least squares approximation · Numerical integration · Direct methods for the solution of linear systems · Iterative methods for the solution of linear and nonlinear systems · Numerical approximation of ordinary differential equations · Introduction to MATLAB and Octave*
LECTURER — *Simone Deparis*

July 2010   HIGH PERFORMANCE COMPUTING
National Institute of Laser Advanced Sciences (NILES)
TOPICS — *Basic theory of HPC topics like Amdahl's law, speed up, UMA and NUMA architectures · GPU architecture · CUDA · Parallel algorithms*

October 2009   COMPUTER GRAPHICS & VISUALIZATION
National Institute of Laser Advanced Sciences (NILES)
TOPICS — *OpenGL Pipeline · Surface rendering · Graphics Modeling using 3D Studio Max*

REVIEWER

February 2020   FRONTIERS IN NEUROSCIENCE
July 2019   JOURNAL OF ELECTRONIC IMAGING (SPIE)
February 2019   IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING
December 2018   IEEE TRANSACTIONS ON COMPUTATIONAL IMAGING
April 2018   JOURNAL OF ELECTRONIC IMAGING (SPIE)
February 2018   BMC BIOINFORMATICS
January 2018   JOURNAL OF ELECTRONIC IMAGING (SPIE)
February 2017   JOURNAL OF MEDICAL IMAGING (SPIE)
May 2016   JOURNAL OF ELECTRONIC IMAGING (SPIE)
March 2016   EUROGRAPHICS SYMPOSIUM ON PARALLEL GRAPHICS & VISUALIZATION (EGPGV) 2016
January 2016   SOFTWAREX (ELSEVIER)
August 2015   DESIGN AUTOMATION FOR EMBEDDED SYSTEMS
July 2015   COMPUTER GRAPHICS FORUM
March 2015   EUROGRAPHICS SYMPOSIUM ON PARALLEL GRAPHICS & VISUALIZATION (EGPGV) 2015
January 2014   JOURNAL OF MEDICAL IMAGING & HEALTH INFORMATICS
August 2012   IEEE, CAIRO INTERNATIONAL BIOMEDICAL ENGINEERING CONFERENCE (CIBEC) 2012

ATTENDED EVENTS, CONFERENCES & WORKSHOPS

October 2019   BLENDER CONFERENCE (BCON) 2019 (SCIENTIFIC VISUALIZATION PANEL)

Amsterdam · Netherlands

September 2019 — Eurographics Computer Graphics & Visual Computing (CGVC) 2019 (Session Chair)
Bangor · Wales · UK

July 2019 — Biological Data Visualization (BioVis 2019) at ISMB ECCB 2019
Basel · Switzerland

July 2018 — 8th Workshop on Biological Data Visualization (BioVis 2018) at ISMB 2018
Chicago IL · USA

March 2018 — The 9th international meeting on Visualizing Biological Data (VIZBI 2018)
Boston · Cambridge MA · USA

October 2017 — The Human Brain Project Summit
Glasgow · Scotland · UK

July 2017 — 7th Workshop on Biological Data Visualization (BioVis 2017) at ISMB 2017
Prague · Czechia

October 2016 — 6th Workshop on Biological Data Visualization (BioVis 2016) at IEEE VIS 2016
Baltimore · MD · USA

May 2016 — The Brain Forum
Lausanne · Switzerland

May 2016 — Eurographics 2016
Lisbon · Portugal

April 2016 — 37th International Symposium on Biomedical Imaging: From Nano to Macro (ISBI 2016)
Prague · Czech Republic

October 2015 — The Second Biomedical Engineering Workshop (Organizer)
Systems & Biomedical Engineering Department · School of Engineering · Cairo University · Cairo · Egypt

October 2015 — The 2nd IEEE EMBS International Students Conference (Keynote)
Cairo · Egypt

September 2015 — The Human Brain Project Summit
Madrid · Spain

August 2015 — 37th International Conference of the IEEE EMB Society (EMBC 2015)
Milan · Italy

July 2015 — 5th Symposium on Biological Data Visualization (BioVis 2015) at ISMB/ECCB 2015
Dublin · Ireland

May 2015 — Eurographics 2015
Zürich · Switzerland

March 2015 — The Brain Forum
Lausanne · Switzerland

December 2014 — IEEE, 7th Cairo International Biomedical Engineering Conference (CIBEC 2014)
Cairo · Egypt

December 2013 — The Brain Forum
Jeddah · The Kingdom of Saudi Arabia

October 2013 — The Human Brain Project Summit
École Polytechnique Fédéral de Lausanne (EPFL) · Lausanne · Switzerland

December 2012 — The First Biomedical Engineering Workshop (Organizer)
Biomedical Engineering Department · School of Engineering · Cairo University · Cairo · Egypt

December 2012 — IEEE, 6th Cairo International Biomedical Engineering Conference (CIBEC 2012)
Cairo · Egypt

November 2012 — Brain Mind Institute (BMI) Retreat Meeting
Bex · VD · Switzerland

April 2011 — Advanced School in High Performance Computing & Grid Computing
International Center for Theoretical Physics (ICTP) · Trieste · Italy

November 2009 — Advanced School in High Performance Computing
International Center for Theoretical Physics (ICTP) · Trieste · Italy

November 2009	IEEE, International Conference of Image Processing (ICIP 2009) *Cairo · Egypt*
March 2009	URSI, 26th National Radio Science Conference (NRSC) *Cairo · Egypt*
December 2008	IEEE, 4th Cairo International Biomedical Engineering Conference (CIBEC 2008) *Cairo · Egypt*

──────────────── OTHER INFORMATION

PERSONAL

Residence	*Lausanne · Switzerland (Permit B since 2011 and valid till 12.2021)*
Address	*Chemin des Mines, 9 · Geneva · 1202*
Mobile Phone	*+41 (0) 79 470 12 20*
HomePage	*www.marwan-abdellah.com*
Emails	*abdellah.marwan@gmail.com · marwan.m.abdellah@ieee.org · marwan.abdellah@epfl.ch*
Languages	English — *Fluent* · French — *Good* · Arabic — *Mothertongue*

PUBLICATIONS

PEER-REVIEWED JOURNAL ARTICLES

Accepted

1. INTERACTIVE VISUALIZATION AND ANALYSIS OF MORPHOLOGICAL SKELETONS OF BRAIN VASCULATURE NETWORKS WITH VESSMORPHOVIS
Oxford Bioinformatics
AUTHORS — ***Marwan Abdellah***, *Nadir Román Guerrero, Samuel Lapere, Jay S. Coggan, Daniel Keller, Benoit Coste, Snigdha Dagaer, Jean-Denis Courcol, Henry Markram, and Felix Schürmann*

January 2019

2. OBJECTIVE MORPHOLOGICAL CLASSIFICATION OF NEOCORTICAL PYRAMIDAL CELLS
Oxford Cerebral Cortex
AUTHORS — *Lida Kanari, Srikanth Ramaswamy, Ying Shi, Sebastien Morand, Julie Meystre, Rodrigo Perin , **Marwan Abdellah**, Yun Wang, Kathryn Hess and Henry Markram*

September 2018

3. A PROCESS FOR DIGITIZING AND SIMULATING BIOLOGICALLY REALISTIC OLIGOCELLULAR NETWORKS DEMONSTRATED FOR THE NEURO-GLIO-VASCULAR ENSEMBLE
Frontiers in Neuroscience
AUTHORS — *Jay S. Coggan, Corrado Cali, Daniel Keller, Marco Agus, Daniya Boges, **Marwan Abdellah**, Kalpana Kare, Heikki O. Lehvaslaiho, Stefan Eilemann, Renaud B. Jolivet, Markus Hadwiger, Henry Markram, Felix Schürmann, Pierre J. Magistretti*

June 2018

4. NEUROMORPHOVIS: A COLLABORATIVE FRAMEWORK FOR VISUALIZATION AND ANALYSIS OF NEURONAL MORPHOLOGY SKELETONS RECONSTRUCTED FROM MICROSCOPY STACKS
Oxford Bioinformatics
AUTHORS — ***Marwan Abdellah***, *Juan Hernando, Stefan Eilemann, Samuel Lapere, Nicolas Antille, Henry Markram, and Felix Schürmann*

September 2017

5. RECONSTRUCTION AND VISUALIZATION OF LARGE-SCALE VOLUMETRIC MODELS OF NEOCORTICAL CIRCUITS FOR PHYSICALLY-PLAUSIBLE IN SILICO OPTICAL STUDIES
BMC Bioinformatics 2017
AUTHORS — ***Marwan Abdellah***, *Juan Hernando, Nicolas Antille, Stefan Eilemann, Henry Markram, and Felix Schürmann*

February 2017

6. BIO-PHYSICALLY PLAUSIBLE VISUALIZATION OF HIGHLY SCATTERING FLUORESCENT NEOCORTICAL MODELS FOR IN SILICO EXPERIMENTATION
BMC Bioinformatics 2017 · Volume 18 · Supplement 2:62
AUTHORS — ***Marwan Abdellah***, *Ahmet Bilgili, Stefan Eilemann, Julian Shillcock, Henry Markram, and Felix Schürmann*

October 2015

7. RECONSTRUCTION AND SIMULATION OF NEOCORTICAL MICROCIRCUITRY
Cell
AUTHORS — *Henry Markram, Eilif Muller, Srikanth Ramaswamy, Michael W. Reimann, **Marwan Abdellah**, Carlos Aguado Sanchez, Anastasia Ailamaki, Lidia Alonso Nanclares, Nicolas Antille, Selim Arsever, Guy Antoine Atenekeng Kahou, Thomas K. Berger, Ahmet Bilgili, Nenad Buncic, Athanassia Chalimourda, Giuseppe Chindemi, Jean-Denis Courcol, Fabien Delalondre, Vincent Delattre, Shaul Druckmann, Raphael Dumusc, James Dynes, Stefan Eilemann, Eyal Gal, Michael Emiel Gevaert, Jean-Pierre Ghobril, Albert Gidon, Joe W. Graham, Valentin Haenel, Etay Hay, Thomas Heinis, Juan B. Hernando, Michael Hines, Lida Kanari, Daniel Keller, John Kenyon, Georges Khazen, Yihwa Kim, James G. King, Zoltan Kisvarday, Pramod Kumbhar, Sebastien Lasserre, Bruno R.C. Magalhaes, Angel Merchán-Pérez, Julie Meystre, Benjamin Roy Morrice, Jeffrey Muller, Alberto Munoz-Cespedes, Shruti Muralidhar, Keerthan Muthurasa, Daniel Nachbaur, Taylor H. Newton, Max Nolte, Aleksandr Ovcharenkov, Juan Palacios, Luis Pastor, Rodrigo Perin, Rajnish Ranjan, Imad Riachi, José-Rodrigo Rodríguez, Roman Juan Luis Riquelme, Christian Andreas Rössert, Ying Shi, Julian C. Shillcock, Ricardo Silva, Farhan Tauheed, Martin Telefont, Maria Toledo-Rodriguez, Thomas Tränkler, Werner Van Geit, Jafet Villafranca Diaz, Richard Walker, Yun Wang, Stefano M. Zaninetta, Javier DeFelipe, Sean L. Hill, Idan Segev and Felix Schürmann*

August 2015

8. THE NEOCORTICAL MICROCIRCUIT COLLABORATION PORTAL: A RESOURCE FOR RAT SOMATOSENSORY CORTEX

Frontiers in Neural Circuits
Authors — *Srikanth Ramaswamy, Jean-Denis Courcol, **Marwan Abdellah**, Stanislaw Adaszewski, Nicolas Antille, Selim Arsever, Atenekeng Kahou Guy Antoine, Ahmet Bilgili, Yury Brukau, Giuseppe Chindemi, Raphael Dumusc, Stefan Eilemann, Lida Kanari, Daniel Keller, James G. King, Rajnish Ranjan, Michael Wolfgang Reimann, Christian Roessert, Martin Telefont, Werner Van Geit, Jafet Villafranca Diaz, Richard Walker, Yun Wang, Stefano Zaninetta, Javier DeFelipe, Sean L Hill, Jeffrey Muller, Idan Segev, Felix Schürmann, Eilif Benjamin Muller and Henry Markram*

August 2015

9. Physically-based In Silico Light Sheet Microscopy for Visualizing Fluorescent Brain Models
BMC Bioinformatics 2015 · Volume 16 · Supplement 11:S8
Authors — ***Marwan Abdellah**, Ahmet Bilgili, Stefan Eilemann, Henry Markram, and Felix Schürmann*

January 2015

10. High Performance GPU-based Fourier Volume Rendering
International Journal of Biomedical Imaging · Article ID 590727
Authors — ***Marwan Abdellah**, Ayman Eldeib and Amr Sharawi*

CONFERENCE PROCEEDINGS

October 2019

11. High fidelity visualization of large scale digitally reconstructed brain circuitry with signed distance functions
IEEE Visualization Conference (IEEE Vis 2019) · Vancouver, Canada
Authors — *Jonas Karlsson, **Marwan Abdellah**, Sebastien Speierer, Alessandro Foni, Samuel Lapere, and Felix Schürmann*

September 2019

12. Generating High Fidelity Surface Meshes of Neocortical Neurons using Skin Modifiers
EG Computer Graphics & Visual Computing (CGVC) 2019 · Bangor, Wales, UK
Authors — ***Marwan Abdellah**, Cyrille Favreau, Juan Hernando, Samuel Lapere, and Felix Schürmann*

July 2018

13. NeuroMorphoVis: a collaborative framework for visualization and analysis of neuronal morphology skeletons reconstructed from microscopy stacks
Workshop on Biological Data Visualization (BioVis 2018), ISMB 2018 · Chicago, USA
Authors — ***Marwan Abdellah**, Juan Hernando, Stefan Eilemann, Samuel Lapere, Nicolas Antille, Henry Markram, and Felix Schürmann*

October 2017

14. From Big Data to Big Displays High-Performance Visualization at Blue Brain
International Conference on High Performance Computing, ISC High Performance 2017 · Frankfurt, Germany
Authors — *Stefan Eilemann, **Marwan Abdellah**, Nicolas Antille, Ahmet Bilgili, Grigory Chevtchenko, Raphael Dumusc, Cyrille Favreau, Juan Hernando, Daniel Nachbaur, Pawel Podhajski, Jafet Villafranca and Felix Schürmann*

July 2017

15. Reconstruction and Visualization of Large-scale Volumetric Models of Neocortical Circuits for Physically-plausible In Silico Optical Studies
7*Workshop on Biological Data Visualization (BioVis 2017), ISMB 2017 · Prague, Czechia*
Authors — ***Marwan Abdellah**, Juan Hernando, Nicolas Antille, Stefan Eilemann, Henry Markram, and Felix Schürmann*

October 2016

16. Bio-physically Plausible Visualization of Highly Scattering Fluorescent Neocortical Models for In Silico Experimentation
6*Workshop on Biological Data Visualization (BioVis 2016), IEEE VIS 2016 · Baltimore, MD, USA*
Authors — ***Marwan Abdellah**, Ahmet Bilgili, Stefan Eilemann, Julian Shillcock, Henry Markram, and Felix Schürmann*

August 2016

17. Efficient Rendering of Digitally Reconstructed Radiographs on Heterogeneous Computing Architectures using Central Slice Theorem
38*Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS) (EMBC 2016) · Orlando, FL, USA*
Authors — ***Marwan Abdellah**, Mohamed Abdallah, Mohamed Alzanati, and Ayman M. Eldeib*

August 2016

18. Parallel Generation of Digitally Reconstructed Radiographs on Heterogeneous Multi-GPU Workstations

38th *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS) (EMBC 2016) · Orlando, FL, USA*
Authors — ***Marwan Abdellah***, *Asem Abdelaziz, Eslam Ali, Sherief Abdelaziz, Abdelrahman Sayed, Mohamed I. Owis, and Ayman M. Eldeib*

May 2016   19. Physically-based Rendering of Highly Scattering Fluorescent Solutions using Path Tracing
Eurographics 2016 · Lisbon, Portugal
Authors — ***Marwan Abdellah***, *Ahmet Bilgili, Stefan Eilemann, Henry Markram, and Felix Schürmann*

April 2016   20. Interactive High Resolution Reconstruction of 3D Ultrasound Volumes on the GPU
2016 IEEE International Symposium on Biomedical Imaging: From Nano to Macro · Prague, Czech Republic
Authors — ***Marwan Abdellah***, *Asem Abdelaziz, and Ayman M. Eldeib*

April 2016   21. Optimized GPU-accelerated Framework for X-ray Rendering using *k*-space Volume Reconstruction
XIV Mediterranean Conference on Medical & Biological Engineering & Computing (MEDICON 2016) · Paphos, Cyprus
Authors — ***Marwan Abdellah***, *Yassin Amer, and Ayman Eldeib*

August 2015   22. Accelerating DRR Generation Using Fourier Slice Theorem on the GPU
37th *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS) (EMBC 2015) · Milan, Italy*
Authors — ***Marwan Abdellah***, *Ayman M. Eldeib, and Mohamed Owis*

August 2015   23. GPU Acceleration for Digitally Reconstructed Radiographs using Bindless Texture Objects and CUDA/OpenGL Interoperability
37th *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS) (EMBC 2015) · Milan, Italy*
Authors — ***Marwan Abdellah***, *Ayman M. Eldeib, and Mohamed Owis*

July 2015   24. Physically-based In Silico Light Sheet Microscopy for Visualizing Fluorescent Brain Models
5th *Symposium on Biological Data Visualization (BioVis 2015) · Dublin, Ireland*
Authors — ***Marwan Abdellah***, *Ahmet Bilgili, Stefan Eilemann, Henry Markram, and Felix Schürmann*

May 2015   25. A Computational Model of Light-Sheet Fluorescence Microscopy using Physically-based Rendering
Eurographics 2015 · Zürich, Switzerland
Authors — ***Marwan Abdellah***, *Ahmet Bilgili, Stefan Eilemann, Henry Markram, and Felix Schürmann*

December 2014   26. MATLAB-based Fourier Volume Rendering Framework
*IEEE, Proceedings of the 7*th *Cairo International Biomedical Engineering Conference (CIBEC 2014) · Cairo, Egypt*
Authors — ***Marwan Abdellah***, *Ayman Eldeib and Amr Sharawi*

December 2014   27. Offline Large Scale Fourier Volume Rendering on Low-end Hardware
*IEEE, Proceedings of the 7*th *Cairo International Biomedical Engineering Conference (CIBEC 2014) · Cairo, Egypt*
Authors — ***Marwan Abdellah***, *Ayman Eldeib and Amr Sharawi*

April 2014   28. cufftShift: High Performance CUDA-accelerated FFT-shift Library
Proceedings of the High Performance Computing Symposium (HPC '14), Article No. 5 · Tampa, FL, USA
Authors — ***Marwan Abdellah***

December 2012   29. Constructing a Functional Fourier Volume Rendering Pipeline on Heterogeneous Platforms
*IEEE, Proceedings of the 6*th *Cairo International Biomedical Engineering Conference (CIBEC 2012) · Cairo, Egypt*
Authors — ***Marwan Abdellah***, *Ayman Eldeib and Amr Shaarawi*

December 2012   30. High Performance Multi-dimensional (2D/3D) FFT-Shift Implementation on Graphics Processing Units (GPUs)

IEEE, Proceedings of the 6ᵗʰ Cairo International Biomedical Engineering Conference (CIBEC 2012) · Cairo, Egypt
Authors — ***Marwan Abdellah***, *Ayman Eldeib and Amr Shaarawi*

December 2012   31. High Performance CUDA-based Implementation for the 2D Version of the Maximum Subarray Problem (MSP)
IEEE, Proceedings of the 6ᵗʰ Cairo International Biomedical Engineering Conference (CIBEC 2012) · Cairo, Egypt
Authors — *Salah Saleh,* ***Marwan Abdellah***, *Ahmed A. Abdel Raouf and Yasser M. Kadah*

May 2012   32. Parallel Rendering on Hybrid Multi-GPU Clusters
Eurographics Symposium on Parallel Graphics and Visualization (EGPGV'12) · Cagliari, Italy
Authors — *Stefan Eilemann, Ahmet Bilgili,* ***Marwan Abdellah***, *Juan Hernando, Maxim Makhinya, Renato Pajarola, and Felix Schürmann*

September 2009   33. GPU-Based Reconstruction and Display for 4D Ultrasound Data
2009 IEEE International Ultrasonics Symposium · Rome, Italy
Authors — *Ahmed Elnokrashy, Ahmed Elmalky, Tamer Hosny,* ***Marwan Abdellah***, *Alaa Megawer, Abubakr Alsebai, Abou-Bakr Youssef and Yasser Kadah*

March 2009   34. Software Development for Low Cost, High quality, Real-time, 4D Ultrasound on Personal Computers
IEEE, 26ᵗʰ National Radio Science Conference (NRSC), Union Radio Scientifique Internationale (URSI) · Cairo, Egypt
Authors — ***Abdellah M.***, *Megawer A. and Kadah Y. Mh*

PRE-PRINTS

October 2019   35. Voltage-sensitive dye imaging reveals inhibitory modulation of ongoing cortical activity
bioRxiv
Authors — *Taylor H Newton,* ***Marwan Abdellah***, *Grigori Chevtchenko, Eilif B Muller, Henry Markram*

January 2018   36. Objective Classification of Neocortical Pyramidal Cells
bioRxiv
Authors — *Lida Kanari, Srikanth Ramaswamy, Ying Shi, Sebastien Morand, Julie Meystre, Rodrigo Perin,* ***Marwan Abdellah***, *Yun Wang, Kathryn Hess, Henry Markram*

January 2018   37. A physically plausible model for rendering highly scattering fluorescent participating media
arXiv.org
Authors — ***Marwan Abdellah***, *Ahmet Bilgili, Stefan Eilemann, Henry Markram, Felix Schürmann*

POSTER ABSTRACTS

July 2019   38. Advances in Neuronal Morphology Analysis, Meshing and Visualization with NeuroMorphoVis
Biological Data Visualization at International Society of Molecular Biology (ISMB) · Basel, Switzerland
Authors — ***M. Abdellah***, *Samuel Lapere, F. Schürmann, H. Markram*

November 2016   39. Characterization of Detection Iso-contours in a Single Fiber Photometry System
2017 Society for Neuroscience (SFN) Meeting · Washington DC, USA
Authors — *M. Mansy,* ***M. Abdellah***, *H. Kim, F. Schürmann and K. Oweiss*

July 2017   40. Reconstruction and Visualization of Large-scale Volumetric Models of Neocortical Circuits for Physically-plausible In Silico Optical Studies
5th Symposium of Biological Data Visualization · Prague, Czech Republic
Authors — ***M. Abdellah***, *Stefan Eilemann, Juan Hernando, F. Schürmann, H. Markram*

November 2016   41. In Silico Voltage Sensitive Dye Imaging in a Digital Reconstruction of Somatosensory Cortex

2016 Society for Neuroscience (SFN) Meeting · San Diego, USA
Authors — *T. H. Newton, **M. Abdellah**, E. Muller, F. Schürmann, H. Markram*

October 2012 42. A Unifying Model of the Neocortical Column 15: High Performance Computing and Software Development Challenges
2012 Society for Neuroscience (SFN) Meeting, 268.A Unifying Model of the Neocortical Column · New Orleans, USA
Authors — *F. Delalondre, **M. Abdellah**, C. Aguado Sanchez, A. Bilgili, N. Buncic, J.-D. Courcol, S. Eilemann, V. Haenel, S. L. Hill, T. Heunus, J. B. Hernando, M. Hines, J. G. King, E. Muller, B. R. C. Magalhaes, G. Mateescu, J. Muller, K. Murthurasa, D. Nachbaur, L. Pastor, J. M. Pena, R. Ranjan, M. W. Reimann, F. Tauheed, W. Van Geit, A. Ailamaki, H. Markram, F. Schürmann*

TECHNICAL REPORTS

February 2015 43. Computational Models and Simulators of functional MRI
A literature review report submitted to Prof. Rolf Gruetter · Neuroscience Doctoral School · École Polytechnique Fédéral de Lausanne (EPFL) · Lausanne · Switzerland
Authors — ***Marwan Abdellah***

THESES

September 2017 44. In Silico Brain Imaging: Physically-plausible Methods for Visualizing Neocortical Microcircuitry
Ph.D. Thesis · Blue Brain Project · Neuroscience Doctoral School · École Polytechnique Fédéral de Lausanne (EPFL) · Lausanne, Switzerland
Authors — ***Marwan Abdellah***

February 2012 45. High Performance Fourier Volume Rendering on Graphics Processing Units (GPUs)
M.Sc. Thesis · Systems & Biomedical Engineering Department, School of Engineering, Cairo University · Cairo, Egypt
Authors — ***Marwan Abdellah***

July 2009 46. High Quality, High Performance, 3D Real-time Ultrasound Volume Reconstruction on Graphics Processing Units (GPUs)
B.Sc. Thesis · Systems & Biomedical Engineering Department, School of Engineering, Cairo University · Cairo, Egypt
Authors — ***Marwan Abdellah**, Alaa Megawer, and Yasser Kaddah*

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