

# Marwan Abdellah

## Curriculum Vitæ

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### EDUCATION

- 09.2012 – 09.2017 **PH.D. · NEUROSCIENCE**  
*Blue Brain Project · Neuroscience Doctoral School · École Polytechnique Fédéral de Lausanne (EPFL)*  
 Lausanne · Switzerland  
 THESIS TITLE — *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 TITLE — *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 TITLE — *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*

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### RESEARCH INTERESTS

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|----------------------------|--|
| 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   |
| 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                              |
| High Performance Computing | GPU computing (GPGPU) with CUDA · Heterogeneous computing with OpenCL · Parallel and distributed computing with OpenMP and sockets   |
| 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 |

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### EXPERIENCE & EMPLOYMENT HISTORY

- 07.2011 – Present **SCIENTIFIC VISUALIZATION ENGINEER**  
*Blue Brain Project · Human 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 — *Felix Schürmann* · LEAD — *Stefan Eilemann*

- 01.2013 – 10.2013 SOFTWARE ENGINEER  
*Coursera 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 ASSISTANT  
*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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## CLASSES & TEACHING

- Spring 2014  
 Spring 2013 NUMERICAL ANALYSIS · MATH-251  
*Life Sciences School · 4<sup>th</sup> 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

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## SELECTED PROJECTS

- 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. The workflow creates watertight mesh models directly from the morphologies and then converts them to volumetric ones based on parallel solid voxelizer.*

- 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.*

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## OPEN SOURCE CONTRIBUTIONS

- 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.*

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## HONORS & AWARDS

- 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**  
 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

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## GRANTS & FELLOWSHIPS

- 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 EGP 10000 from ITAC to support my graduation project.

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## TECHNICAL

Programming	C/C++ · Python · JAVA · 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 · PHP · JavaScript
Software Process	Agile · Scrum · Bamboo · Jira · Jenkins
Scientific Packages	MATLAB · Octave · Vensim
3D Graphics	Maya (including MEL scripting) · 3DSMax · Blender (scripting with Python)
Design & Web	Gimp · Adobe Photoshop · Adobe Illustrator · Adobe After Effects · Adobe Muse
Typography	LaTeX · Lyx · Microsoft Office
Others	Git · SVN · Doxygen

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## PROFESSIONAL ACTIVITIES

### PROFESSIONAL MEMBERSHIPS

- 01.2010 – Present GRADUATE STUDENT MEMBER  
*Institute of Electrical and Electronic Engineers (IEEE)*
- 01.2010 – Present GRADUATE STUDENT MEMBER  
*IEEE Engineering in Medicine and Biology Society (EMBS)*
- 02.2015 – Present GRADUATE STUDENT MEMBER  
*IEEE Engineering Computer Society*
- 04.2015 – Present STUDENT MEMBER  
*The European Association of Computer Graphics (Eurographics)*
- 05.2015 – Present STUDENT MEMBER  
*International Society for Computational Biology (ISCB)*

### REVIEWER

- 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 2017 **THE HUMAN BRAIN PROJECT SUMMIT**  
 Glasgow · Scotland · UK

September 2017 **7<sup>th</sup> NEUROBRIDGES · A MEDITERRANEAN, MIDDLE EASTERN SUMMER SCHOOL IN COMPUTATIONAL NEUROSCIENCE**  
 Cluny · France

July 2017 **7<sup>th</sup> WORKSHOP ON BIOLOGICAL DATA VISUALIZATION (BioVis 2016) AT ISMB 2017**  
 Prague · Czechia

October 2016 **6<sup>th</sup> 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 **37<sup>th</sup> 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 2<sup>nd</sup> IEEE EMBS INTERNATIONAL STUDENTS CONFERENCE (KEYNOTE)**  
 Cairo · Egypt

September 2015 **THE HUMAN BRAIN PROJECT SUMMIT**  
 Madrid · Spain

August 2015 **37<sup>th</sup> INTERNATIONAL CONFERENCE OF THE IEEE EMB SOCIETY (EMBC 2015)**  
 Milan · Italy

July 2015 **5<sup>th</sup> 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, 7<sup>th</sup> 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, 6<sup>th</sup> 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, 26<sup>th</sup> NATIONAL RADIO SCIENCE CONFERENCE (NRSC)  
Cairo · Egypt

December 2008 IEEE, 4<sup>th</sup> CAIRO INTERNATIONAL BIOMEDICAL ENGINEERING CONFERENCE (CIBEC 2008)  
Cairo · Egypt

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## OTHER INFORMATION

### PERSONAL

*Residence* PERMIT B · Lausanne · Switzerland (since 2010)

*Address* Campus Biotech · Chemin des Mines, 9 · Geneva · CH-1202 · Switzerland

*Mobile Phone* +41 (0) 79 470 xx xx

*HomePage* [www.marwan-abdellah.com](http://www.marwan-abdellah.com)

*Emails* [abdellah.marwan@gmail.com](mailto:abdellah.marwan@gmail.com) · [marwan.m.abdellah@ieee.org](mailto:marwan.m.abdellah@ieee.org) · [marwan.abdellah@epfl.ch](mailto:marwan.abdellah@epfl.ch)

*Languages* ENGLISH — *Fluent* · FRENCH — *Good* · ARABIC — *Mothertongue*

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## PUBLICATIONS

### PEER-REVIEWED JOURNAL ARTICLES

- In Press*     **1. 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*     **2. 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*     **3. 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 Delalandre, 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 Kisvárdy, Pramod Kumbhar, Sebastien Lasserre, Bruno R.C. Magalhaes, Angel Merchán-Pérez, Julie Meystre, Benjamin Roy Morrice, Jeffrey Muller, Alberto Munoz-Céspedes, Shruti Muralidhar, Keerthan Muthurasa, Daniel Nachbaur, Taylor H. Newton, Max Nolte, Aleksandr Ocharenkov, 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*     **4. 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*     **5. 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*     **6. 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 2017*     **7. 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 Cheotchenko, Raphael Dumusc, Cyrille Favreau, Juan Hernando, Daniel Nachbaur, Pawel Podhajski, Jafet Villafranca and Felix Schürmann
- July 2017*     **8. RECONSTRUCTION AND VISUALIZATION OF LARGE-SCALE VOLUMETRIC MODELS OF NEOCORTICAL CIRCUITS FOR PHYSICALLY-PLAUSIBLE IN SILICO OPTICAL STUDIES**  
*7<sup>th</sup> 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 **9. BIO-PHYSICALLY PLAUSIBLE VISUALIZATION OF HIGHLY SCATTERING FLUORESCENT NEOCORTICAL MODELS FOR IN SILICO EXPERIMENTATION**  
6<sup>th</sup> 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 **10. EFFICIENT RENDERING OF DIGITALLY RECONSTRUCTED RADIOGRAPHS ON HETEROGENEOUS COMPUTING ARCHITECTURES USING CENTRAL SLICE THEOREM**  
38<sup>th</sup> 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 **11. PARALLEL GENERATION OF DIGITALLY RECONSTRUCTED RADIOGRAPHS ON HETEROGENEOUS MULTI-GPU WORKSTATIONS**  
38<sup>th</sup> 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 **12. 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 **13. 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 **14. 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 **15. ACCELERATING DRR GENERATION USING FOURIER SLICE THEOREM ON THE GPU**  
37<sup>th</sup> 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 **16. GPU ACCELERATION FOR DIGITALLY RECONSTRUCTED RADIOGRAPHS USING BINDLESS TEXTURE OBJECTS AND CUDA/OPENGL INTEROPERABILITY**  
37<sup>th</sup> 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 **17. PHYSICALLY-BASED IN SILICO LIGHT SHEET MICROSCOPY FOR VISUALIZING FLUORESCENT BRAIN MODELS**  
5<sup>th</sup> Symposium on Biological Data Visualization (BioVis 2015) · Dublin, Ireland  
AUTHORS — *Marwan Abdellah, Ahmet Bilgili, Stefan Eilemann, Henry Markram, and Felix Schürmann*
- May 2015 **18. 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 **19. MATLAB-BASED FOURIER VOLUME RENDERING FRAMEWORK**



IEEE, Proceedings of the 7<sup>th</sup> Cairo International Biomedical Engineering Conference (CIBEC 2014) · Cairo, Egypt  
 AUTHORS — **Marwan Abdellah**, Ayman Eldeib and Amr Sharawi

- December 2014 **20. OFFLINE LARGE SCALE FOURIER VOLUME RENDERING ON LOW-END HARDWARE**  
 IEEE, Proceedings of the 7<sup>th</sup> Cairo International Biomedical Engineering Conference (CIBEC 2014) · Cairo, Egypt  
 AUTHORS — **Marwan Abdellah**, Ayman Eldeib and Amr Sharawi
- April 2014 **21. 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 **22. CONSTRUCTING A FUNCTIONAL FOURIER VOLUME RENDERING PIPELINE ON HETEROGENEOUS PLATFORMS**  
 IEEE, Proceedings of the 6<sup>th</sup> Cairo International Biomedical Engineering Conference (CIBEC 2012) · Cairo, Egypt  
 AUTHORS — **Marwan Abdellah**, Ayman Eldeib and Amr Shaarawi
- December 2012 **23. HIGH PERFORMANCE MULTI-DIMENSIONAL (2D/3D) FFT-SHIFT IMPLEMENTATION ON GRAPHICS PROCESSING UNITS (GPUS)**  
 IEEE, Proceedings of the 6<sup>th</sup> Cairo International Biomedical Engineering Conference (CIBEC 2012) · Cairo, Egypt  
 AUTHORS — **Marwan Abdellah**, Ayman Eldeib and Amr Shaarawi
- December 2012 **24. HIGH PERFORMANCE CUDA-BASED IMPLEMENTATION FOR THE 2D VERSION OF THE MAXIMUM SUBARRAY PROBLEM (MSP)**  
 IEEE, Proceedings of the 6<sup>th</sup> Cairo International Biomedical Engineering Conference (CIBEC 2012) · Cairo, Egypt  
 AUTHORS — Salah Saleh, **Marwan Abdellah**, Ahmed A. Abdel Raouf and Yasser M. Kadah
- May 2012 **25. 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 **26. 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 Aelsebai, Abou-Bakr Youssef and Yasser Kadah
- March 2009 **27. SOFTWARE DEVELOPMENT FOR LOW COST, HIGH QUALITY, REAL-TIME, 4D ULTRASOUND ON PERSONAL COMPUTERS**  
 IEEE, 26<sup>th</sup> National Radio Science Conference (NRSC), Union Radio Scientifique Internationale (URSI) · Cairo, Egypt  
 AUTHORS — **Abdellah M.**, Megawer A. and Kadah Y. Mh
- POSTER ABSTRACTS**
- July 2017 **28. RECONSTRUCTION AND VISUALIZATION OF LARGE-SCALE VOLUMETRIC MODELS OF NEOCORTICAL CIRCUITS FOR PHYSICALLY-PLAUSIBLE IN SILICO OPTICAL STUDIES**  
 5th Symposium of Biological Data Visualization  
 AUTHORS — T. H. Newton, M. Abdellah, E. Muller, F. Schürmann, H. Markram
- November 2016 **29. 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 **30. 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 **31. 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 **32. 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**

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