

Curriculum Vitae

Szymon Stoma, PhD

Personal Details

Name	Szymon Stoma
Individual WWW	http://stoma.name/
Group WWW	http://let-your-data-speak.com/
Current location	Zurich, Switzerland
Birth Details	8th May, 1981, Szczecin, Poland
Nationality	Polish
Languages	Polish(native), English(fluent), French(fluent), German(communicative), Spanish(communicative)
Twitter	sstoma

About

I hold a permanent position as Staff Scientist working in the field of Image and Data Analysis in Scientific Center for Optical and Electron Microscopy of ETH Zurich as well as being CEO of MicroscopeIT, a 30 person AI R&D software house specialising in Computer Vision, Cloud and Machine Learning. In 2019 I successfully merged MicroscopeIT with Tooploox, effectively scaling it up to 150 people. I am also an Angel Investor in the Cat-astrophe Games and some other deeptech companies.

My career has been largely R&D focused, and I have been fortunate to work with some truly inspiring people while my early career at the French Institute for Research in Computer Science and Automation (INRIA) during my PhD and postdoc, at the Massachusetts Institute of Technology (MIT) as a Visiting Scientist, Humboldt University Berlin (HUB) as a postdoc and at the Swiss Federal Institute of Technology (ETH) as a Staff Scientist.

Education

Dec 2008 - Dec 2012	MIT (host: Prof. Ron Weiss), USA Broad Institute (host: Prof. Anne Carpenter), USA WPUT (host: Prof. Antoni Wilinski), Poland NUS (host: Prof. P.S. Thiagarajan), Singapore ENS Lyon (host: Prof. Jan Traas), Lyon Short scientific stays and visits
Oct 2005 - Dec 2008	University of Montpellier 2, France Ecole Normale Superieure (ENS) de Lyon Institut National de Recherche en Informatique et Automatique (INRIA) PhD in Computer Science: <i>Modeling development of shoot apical meristem of Arabidopsis</i>
Oct 2000 - Oct 2005	University of Wroclaw, Poland Department of Mathematics and Computer Science Master in Computer Science: <i>Efficient and optimal path-finding algorithm in partially unknown environment</i>
Dec 2004 - Jun 2005	University of Cadiz, Spain Escuela Superior de Ingenieria Socrates-Erasmus exchange programme
Sep 2004 - Oct 2005	University of Wroclaw, Poland Department of Biology and Life Science
Aug 1995 - Jun 2000	High school: XIII LO Szczecin, Poland Individual Learning Path School ranked at 1-5 place in Poland in the period 2000-2019

Academic experience

Nov 2013 - Present	Image&Data Analyst (senior staff scientist) ETH Zurich (Nicolas BLANC; Scientific Center for Optical and Electron Microscopy) Zurich, Switzerland
Jul 2011 - Mar 2014	Experienced researcher (post-doc) INRIA (Gregory BATT; Lifeware modelling group) Paris, France
Dec 2008 - Jun 2011	Experienced researcher (post-doc) Humboldt University (Edda KLIPP; Theoretical Biophysics group) Berlin, Germany
Oct 2010 - Feb 2011	Visiting lecturer (one day a week) West Pomeranian University of Technology Szczecin, Poland
Oct 2005 - Dec 2008	Engineer / PhD. INRIA (Christophe GODIN and Jan TRAAS; Plant modeling group) Montpellier, France
Dec 2004 - Oct 2005	Research assistant University of Wroclaw - Institute of Plant Botany Wroclaw, Poland

Industry experience

Mar 2019 - Present	CEO and partner MicroscopeIT part of Tooploox Wroclaw, Poland AI R&D Software house specializing in AI and Computer Vision (29 people in 2019)
Dec 2018 - Present	Investor Cat-astrophe Games Wroclaw, Poland Gamedev. studio
Dec 2015 - Mar 2019	CEO and owner MicroscopeIT Wroclaw, Poland AI R&D Software house specializing in AI and Computer Vision (29 people in 2019)
Jun 2017 - Mar 2019	Co-founder Histopixel Wroclaw, Poland Startup focusing on using AI in cancer diagnostics
Dec 2017 - Mar 2019	Investor Vratis Wroclaw, Poland Consulting company specializing in CFD simulations
Oct 2001 - Aug 2004	Various intern positions: developer, software architect Longavita, British Petroleum Szczecin / Cracow, Poland

Scientific interests& engineering skills

Life-Science	Bioimage Analysis; Systems Biology; Microscopy (hardware, workflows&high-throughput);
Computer Science	Image Analysis; Computer Vision; Machine Learning; Complex Dynamical Systems;
Engineering	Programming (everyday use): Python ML: HPC (cluster/cloud), Keras, numpy, pandas, scikit, opencv; Microscope instrument handling; Image processing workflows: ImageJ/Fiji, CellProfiler, IMARIS, Ilastik, scripting;
Engineering(past projects)	Programming: C++, Matlab, Java, C, R, Object Pascal, PHP, Bash; Programming non-imperative: Prolog, Clips and SML; Web: HTML, XML, CSS, PHP, SQL; UNIX-like: Linux, Mac OS X; Numerical methods: Statistics, optimization, calculus, Scipy (ODE, visualization); Rapid Application Development: TraitsUI 3D Visualisation: VTK, MayaVi.

Grants

- Co-author of European DigITal Histology repository for AI development, ca. 30m EUR (my part 1m EUR), waiting
- *Co-author of The European Health Imaging Network and Artificial Intelligence App Store*, ca. 10m EUR (my part 1.1m EUR), waiting
- *Co-author of ExaMode: Extreme-scale Analytics via Multimodal Ontology Discovery and Enhancement*, ca. 5m EUR (my part 0.7m EUR), funded
- Co-author of GameINN Platform for City Stories Games: AI system for location comparing robust to environmental conditions, ca. 0.75m EUR, funded
- Co-author of Deep Learning and Plankton Dynamics: Predicting Algal Blooms from Automated Underwater Microscopy in Swiss Lakes, ca. 1m CHF, waiting
- Co-author of Fortissimo MicroscopeIT, ca. 0.7m Euro, funded
- *Co-author of internal ScopeM grant 2015: CellStar* (we propose to adapt an algorithm to microfluidics platform), 30k CHF, funded
- *Co-author of internal ScopeM grant 2015: MOOC* (we propose to establish EdX Introduction to Image Analysis course), 20k CHF, funded
- *Co-author of grant COST European Bioimaging 2015-2020* (bioimage analysis network coordinated on EU level), > 1m Euro, funded
- *Author of grant application for Systems Biology Model Checker* (we proposed to build tools supporting model verification in Systems Biology details are here), value: ca. 0.1 million Euro, funded
- *Co-author of Google Summer School of Code 2011* (we proposed to build tools supporting editing and visualizing pathways in the internet browser using cutting edge technologies - details are here), funded

Software projects

- EssentialVision, co-founder, https://www.essential-vision.org/
- Taxonify, co-founder, https://www.taxonify.org/
- Virtum, co-founder, http://www.microscopeit.com/
- CellStar, co-founder, http://cellstar-algorithm.org/
- Spatio Temporal Simulation Environment, founder, http://stse-software.org
- Systems Biology Model Checker, founder and dev., http://stoma.name/
- Yeast Image Toolkit, founder and dev., http://yeast-image-toolkit.biosim.eu/
- Openalea, core dev., http://openalea.gforge.inria.fr/

Publications:¹

Journal articles

- *AutoTube: a novel software for the automated morphometric analysis of vascular networks in tissues*, Montoya-Zegarra J et al., Angiogenesis, 2019.
- Spatial analysis of the bone marrow stroma using deep learning, <u>Gomaritz A</u> et al., Swiss Medical Weekly, 2018.

¹First author is underlined

- *Quantitative spatial analysis of haematopoiesis-regulating stromal cells in the bone marrow microenvironment by 3D microscopy*, <u>Gomaritz A</u> et al., Nature Comm., 2018.
- *VEGF-A regulates cellular localization of SR-BI as well as transendothelial transport of HDL but not LDL,* Velagapudi S et al., Arteriosclerosis, thrombosis, and vascular biology, 2017.
- *Hypoxia Induces a HIF-1-Dependent Transition from Collective-to-Amoeboid Dissemination in Epithelial Cancer Cells*, Lehmann S et al., Current Biology, 2017.
- *Robust Long-Term Individual Cell Tracking from Brightfield Microscopy Images of Budding Yeast,* Versari C, Stoma S and Batmanov K et al., Journal of Royal Society Interface, 2017.
- In vivo imaging of the activity of CEA TCB, a novel T-cell bispecific tumor targeting and fast induction of T-cell mediated tumor killing, Lehmann S et al., Clinical Cancer Research, 2016.
- Dynamics of cell-to-cell variability in TRAIL-induced apoptosis explains fractional killing and predicts reversible resistance, <u>Bertaux F</u>, Stoma S, Drasdo D, Batt G, PLoS Computational Biology, 2014.
- Bridging the gaps in Systems Biology, Cvijovic M et al., Mol Genet Genomics, 2014.
- *STL-based analysis of TRAIL-induced apoptosis challenges the notion of type I/type II cell line classification,* <u>Stoma S, Donze A</u>, Bertaux F, Maler O, Batt G PLoS Computational Biology 9(5), 2013.
- *STSE: Spatio-Temporal Simulation Environment Dedicated to Biology*, <u>Stoma S</u>, Froechlich M, Gerber S, Klipp E, BMC Bioinformatics, 12(1):126, 2011.
- Flux-Based Transport Enhancement as a Plausible Unifying Mechanism for Auxin Transport in Meristem Development, <u>Stoma S</u>, Lucas M, Chopard J, Schaedel M, Traas J, Godin C, PLoS Computational Biology 4(10), 2008.

Proceedings (till 2018)

- *Applying 3D quantitative microscopy to study global topography and cellular interactions in the bone marrow,* <u>Gomariz A</u> et al., IBSB, Jena, 2016.
- Image-based modeling of drug delivery in HeLa multicellular spheroids, Stoma S et al., IBSB, Jena, 2014.
- Yeast Image Toolkit: A benchmark and evaluation strategy for yeast segmentation and tracking algorithms, <u>Stoma S</u> et al., Image Bioinformatics, Leuven, 2014.
- *Using Signal Temporal Logics to analyze signaling pathways*, <u>Stoma S</u> et al., Swiss Institute of Bioinformatics Open Days, Biel, 2013.
- *Systematic model building: modeling in space and time,* <u>Stoma S</u>, SysteMTb First Annual Meeting and the First Workshop on TB Biology and Modeling, Liblice, Czech Republic, March 21-24, 2011.
- *Towards modeling of spatial dynamic systems based on microscopy images,* <u>Stoma S</u>, Proceedings of 6th Workshop on Computation of Biochemical Pathways and Genetic Networks, Heidelberg, 2010
- Spatio-Temporal Simulation Environment: a microscopy image based modelization framework, <u>Stoma S</u>, Klipp E., Microscopy and Microanalysis, 16 (Suppl. 2), pp 734-735, 2010
- Using mechanics in the modeling of meristem morphogenesis, <u>Stoma S</u>, Chopard J, Godin C, Traas J: Functionalstructural plant models (FSPM), Napier, New Zealand, November 4-9, 2007
- OpenAlea: An open-source platform for the integration of heterogeneous FSPM components, <u>Dufour-Kowalski S</u> et al., Functional-structural plant models (FSPM), Napier, New Zealand, November 4-9, 2007

Other (till 2012)

- *STL-based analysis of TRAIL-induced apoptosis challenges the notion of type I/type II cell line classification,* <u>Stoma S</u>, Donze A, Bertaux F, Maler O, Batt G, INRIA-Research Report (RR-8121), 2012.
- Defining Modeling Strategies for Systems Biology, Jirstrand M et al., report for the EU commission, 2011.
- *Modeling development of shoot apical meristem of Arabidopsis,* <u>Stoma S</u>, PhD thesis in Computer Science, Montpellier, France, 02/2009
- *Efficient and optimal path-finding algorithm in partially unknown environment*, <u>Stoma S</u>, Master thesis in Computer Science, Wroclaw, Poland, 01/2006

Invited speaker talks (till 2015)

- Introduction to Image processing and analysis, 9th Zurich Summer School on Multiscale Biomedical Imaging, Zurich, Switzerland, 2015
- Systematic model building: modeling in space and time, First Annual Meeting and Workshop on Tuberculosis Biology and Modeling, Prague, Czech Republic, 2011
- *Towards modeling of spatial dynamic systems based on microscopy images,* 6th Workshop on Computation of Biochemical Pathways and Genetic Networks, Heidelberg, Germany, 2010
- *Mathematical modeling in the context of aquaporin regulation,* Aquaporins: from structure to function, Nijmegen, Netherlands, 2009
- Modeling of meristem development, Lyon, France, 2008

Teaching

- Deep Learning for Image Analysis, EMBL, 2020
- Multiple ZIDAS school Intensive course in Image Analysis for biologists, 2017-2019
- Multiple NeuBIAS network Intensive course in Image Analysis for biologists, 2015-2019
- Intensive course in Image and Data Unit, ETH, 2013-2019
 - Introduction to Image Analysis, (24h, lab., 2 times per year)
 - Introduction to IMARIS, (8h, lab.)
- PhD school on Image Analysis, Copenhagen, 2016
- Bioimage Data Analysis, EMBL, Heidelberg, 2016
- Introduction to image segmentation, Zurich Summer School on Biomedical Imaging, ETH Zurich, 2015
- Introduction to CellProfiler, 7th course on optical microscopy imaging for bioscience, IBMC, Porto, 2015
- PhD school on Image Analysis, Copenhagen, 2015
- Bioimage Data Analysis, EMBL, Heidelberg, 2014
- Image Analysis, Focused Ion Beams Workshop, ETH Zurich, 2014
- Introduction to image segmentation with ilastik, Zurich Summer School on Biomedical Imaging 2014
- Python in bioinformatics, (8h, lect.+lab.), 2010/2011
- Team programming, (60h, lect.+lab.), 2010/2011
- Modeling signaling networks, (4h, lab.), 2010/2011
- Intensive course for Biophysics students, 2009/2010
 - Pattern formation in biological systems, (8h, lect.+lab.)
 - Introduction to Matlab, (8h, lect.+lab.)
- Statistical physics, (45h, lect.+lab.), 2009/2010
- Intensive course for Biophysics students, 2008/2009
 - Pattern formation in biological systems, (8h, lect.+lab.)

Students

- Gabriela Evrova, ETH Zurich, master I internship, ETH 2018-2019
- Krzysztof Lis, ETH Zurich, master I internship, ETH 2017-2018
- Alvaro Gomaritz, ETH Zurich, master II thesis, ETH 2016
- Filip Mroz, University of Wroclaw, master II thesis, INRIA 2013
- Adam Kaczmarek, University of Wroclaw, master II thesis, INRIA 2013
- Hugues Asofa Zeufack, Ecole Polytechnique, master I internship, INRIA 2012
- Wabo Arsene, HUB, master I internship, Humboldt University Berlin 2010

Other important roles (till 2017)

- Co-founder of Zurich Image and Data Analysis School, 2017-2019
- An external expert invited for the IMPROVER Network Verification Challenge Jamboree (Systems Biology effort to use crowd sourcing to curate bio-knowledge; project run by IBM and Phillip Morris), 2014
- Mentor for Google Summer School of Code@TPB, 2011,
- An external expert invited for the FutureSysBio 2010 (a coordination and support action that aim at shaping and predicting the future development of the field Systems Biology working for the European Commission), 2010
- *Member of the Humboldt University Recruitment Commission* evaluating candidates for Junior Professorship in Biophysics, 2009
- Reviewer for the PLoS Computational Biology, 2009-present

Organization (till 2010)

- Coordination of the european Aquaglyceroporin meeting in Berlin , (ca. 20 people, 5 countries), 2010
- Co-coordination of the european Sy-stem meeting in Montpellier (ca. 40 people, 10 countries), 2008

Conferences and meeting with oral presentations (till 2015)²

- European BioImage Ananlysis Symposium*, Paris, France, 2015.
- Quantitative Bioimaging*, Paris, France, 2015.
- Image Based Systems Biology, Jena, Germany, 2014.
- Image Bioinformatics, Leuven, Belgium, 2014.
- Swiss Institute of Bioinformaticts Open House*, Biel, Switzerland, 01/2013
- Open phyllotaxis meeting, Montpellier, France, 05/2011
- First Annual Meeting and Workshop on Tuberculosis Biology and Modeling, Prague, Czech Republic, 03/2011
- 6th Workshop on Computation of Biochemical Pathways and Genetic Networks, Heidelberg, Germany, 09/2010
- Microscopy and Microanalysis, Portland, USA, 08/2010
- ERAsysBio, Tenerife, Spain, 07/2010
- EMBO Workshop Advanced Light Microscopy Techniques and their Applications*, Heidelberg, Germany, 05/2010

²Star marks poster presentation

- Aquaporins (PM), Berlin, Germany, 05/2010
- Aquaporins (PM), Nijmegen, Netherlands, 12/2009
- Aquaporins (PM), Goettingen, Germany, 05/2009
- Aquaporins (PM)*, Aarhus, Denmark, 12/2008
- System Biology MEET*, Berlin, Germany, 08/2008
- IBSB*, Berlin, Germany, 08/2008
- The understanding and modeling of auxin transport in plants, Nottingham*, UK, 05/2008
- Sy-stem (PM), Montpellier, France, 04/2008
- Functional-structural plant models (FSPM), Napier, New Zealand, 11/2007
- Sy-stem (PM), Zurich, Switzerland, 12/2007
- Sy-stem (PM), Ghent, Belgium, 04/2007
- Sy-stem (PM), Katowice, Poland, 11/2006
- Sy-stem (PM), Tubingen, Germany, 03/2006
- Sy-Stem (PM)*, Lyon, France, 10/2005

Miscellaneous

Skills	Strong negotiation and interpersonal skills; Strong skills in presenting complex ideas to various audience; Ability to work in multidiscipling any environment.	
	Empathy;	
	Common sense.	
Hobbies	public health system&future of medicine; surfing; board games;	

References

Simon NOERRELYKKE	Image and Data Analysis head at Scopem ETH Zurich simon.noerrelykke@scopem.ethz.ch http://let-your-data-speak.com/
Edda KLIPP	Prof. Dr. Dr. h.c. Humboldt University Berlin edda.klipp@rz.hu-berlin.de http://www2.hu-berlin.de/biologie/theorybp/
Gregory BATT	Research scientist INRIA Paris-Roquencourt, gregory.batt@inria.fr http://contraintes.inria.fr/~batt/
Christophe GODIN	Research director INRIA Sophia-Antipolis, christophe.godin@inria.fr https://team.inria.fr/virtualplants/