Georges Hattab

Curriculum Vitae

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Nationality: French. Born 2nd Sep. 1988

Degrees

2018   **PhD (Dr. rer. nat.), Bioimage Informatics, Bioinformatics**,
Faculty of Technology, Bielefeld University, Bielefeld, Germany.

2014   **Master of Science, Technology, Healthcare, Bioinformatics**,
Université Paris VII, Denis Diderot, Université Sorbonne Paris Cité, Paris, France.

2012   **Bachelor of Science, Technology, Healthcare, Bioinformatics**,
Université Paris VII, Denis Diderot, Université Sorbonne Paris Cité, Paris, France.

Education & Development

2019–2021   **Lecturer and junior group leader**, *Philipps-Universität Marburg, Department of Mathematics and Computer Science, Molecular Storage for Long term Archiving (MOSLA)*, Marburg, Germany.
Developing automatic workflows and visualizations for information storage systems that rely on biological and chemical compounds

2019–2021   **Head of division**, *Philipps-Universität Marburg, Department of Mathematics and Computer Science, Division of Bioinformatics*, Marburg, Germany.
Machine learning and bioinformatics for Omics data. Advised by Prof. Dominik Heider

2018–2019   **Postdoc**, *National Center for Tumor Diseases (NCT), German Cancer Research Center (DKFZ), Division of Translational Surgical Oncology, University Hospital Carl Gustav Carus, Technical University*, Dresden, Germany.
Biomechanical analysis and computer vision for augmented reality of the kidney organ in the field of computer- and robot-assisted surgery. Supervised by Prof. Stefanie Speidel

2014–2017   **PhD**, *Bielefeld University, Biodata Mining Group, Computational Methods for the Analysis of the Diversity and Dynamics of Genomes, German-Canadian DFG Int. Research Training Group*, Bielefeld, Germany.
Analyzing colony dynamics and visualizing cell diversity in spatiotemporal experiments. Supervised by Prof. Tim W. Nattkemper and Prof. Tamara Munzner

2016   **Visiting Grad student**, *University of British Columbia (UBC), InfoVis Group*, Vancouver, BC, Canada.
Development of an efficient algorithm and data abstractions to analyze bacterial colony growth in time-lapse image data. Supervised by Prof. Tamara Munzner

2014 **Master**, *Laboratory of Evolution, Genomes and Speciation (LEGS), CNRS UPR 9034*, Gif-sur-Yvette, France.

Detection and analysis of trajectory patterns of *Drosophila melanogaster* in a spatial system based on the Morris water maze. Supervised by Dr. Frederic Mery

2013 **Internship**, *Institute of Biological Physical Chemistry (IBPC), CNRS UMR 7099*, Paris, France.

Proteome and metabolome study of the bacterium strain C43(DE3) throughout membrane proliferation in *Escherichia coli*. Supervised by Prof. Bruno Miroux

2013 **Research assistant**, *Necker-Enfants Malades Hospital, Necker Proteomics (PPN), Paris Descartes University, Inserm US 24 CNRS UMS 3633*, Paris, France.

Software deployment and data mining for label-free proteomics. Supervised by Dr. Chiara Guerrera

2012 **Bachelor**, *Institute of Biological Physical Chemistry (IBPC), CNRS UMR 7099*, Paris, France.

Establishment of a bibliographic and bioinformatics mining tool to research the over-expression of heterologous membrane proteins. Supervised by Prof. Bruno Miroux

2010 **Internship**, *Institute Jacques Monod (IJM), CNRS UMR 7592*, Paris, France.

Gene expression profiling and database creation to assess genetic regulations in iron homeostasis in *Saccharomyces cerevisiae*. Supervised by Dr. Denis Mestivier.

Further Experience

2021 **Workshop** 'Evidence-Based Approaches to Improve Your Teaching – Designing Assessments.' D. Meredith, P. Soto. The Biophysical Society

2020 **Workshop** on DNA, polymers and big data from the Transdisciplinary Technology and Health Meetings, 'Colloque ADN, polymères et big data.' CNRS and Académie des Technologies. Paris, France

2019 **Workshop** 'Computational Pan-Genomics.' Center for Interdisciplinary Research. J. Stoye, A. Schönhuth. Bielefeld, Germany

2019 **Workshop** 'Perceptual Capacities and Constraints in AR/VR for the visualization of 3D biomedical image data.' Computer Assisted Radiology and Surgery (CARS). R. Eagleson, U. Eck, G. Hattab, B. Preim. Rennes, France

2019 **Workshop** 'Surgical Data Science.' Le Couvent des Jacobins Center. L. Maier-Hein, P. Jannin, S. Speidel. Rennes, France

2017 **Springer Cover design** for 'Comparative Genomics: Methods and Protocols.' Stoye et al. 2017

2016 **Workshop** 'Algorithms for Comparative Genomics.' C. Chauve, J. Stoye. Simon Fraser University. Burnaby, Canada

2016 **Workshop** 'Academic Writing in Natural Sciences.' M. Gould. Bielefeld University. Bielefeld, Germany

2015–2016 **Student Representative** of the graduate school 'Computational Methods for the Analysis of the Diversity and Dynamics of Genomes.'

2015 **Workshop** 'Intense Course on Data Mining and Visualization'. M. Ester, T.W. Nattkemper, and B. Hammer

2015 **Workshop** 'Intense Course on Cancer Genomics.' R. Morin, Y. Wang, A. Cherkasov, S. Volik, R Brinkman, A. Wyatt, S. Shah, and A. Bouchard. Simon Fraser University. Burnaby, Canada

2015 **Workshop** '13th Bioinformatics Research and Education Workshop (BREW).' University of Tartu. Tartu, Estonia

2015 **Workshop** 'Biodata Visualization and Subcellular localization'. W. Duddy, J. Krüger, S. Müller, and T. Wallmeyer. University of Bielefeld. Bielefeld, Germany

2014 **Volunteer curator** for the United Nations Development Programme (UNDP). Lead curator and book designer for an international collaborative publication: Reversality

2012 **Volunteer curator** for the United Nations Children's Fund, UNICEF France. Lead curator and organizer for an international exhibition at PLÂTRE émoi. Paris, France

2011–2014 **Volunteer rescuer** at the French Red Cross (Croix-Rouge Française). Paris, France.

Publications

2021 **Anžel, A., Heider, D., Hattab, G.**, *The Visual Story of Data Storage: From Storage Properties to User Interfaces*, Computational and Structural Biotechnology Journal, doi.org/10.1016/j.csbj.2021.08.031.

2021 **Arnold, M., Speidel, S., Hattab, G.**, *Towards improving edge quality using combinatorial optimization and a novel skeletonize algorithm*, BMC Medical Imaging, 21 (1), 1-9, doi.org/10.1186/s12880-021-00650-z.

2021 **Hattab, G., Hatzipanayioti, A., Klimova, A., Pfeiffer, M., Klausing, P., Breucha, M., . . . , & Speidel, S.**, *Investigating the utility of VR for spatial understanding in surgical planning: Evaluation of head-mounted to desktop display*, Scientific Reports, 11(1), 1-11, doi.org/10.1038/s41598-021-92536-x.

2021 **Spänig, S., Mohsen, S., Hattab, G., Hauschild, A. C., & Heider, D.**, *A large-scale comparative study on peptide encodings for biomedical classification*, NAR genomics and bioinformatics, 3(2), doi.org/10.1093/nargab/lqab039.

2021 **Sperlea, T., Kreuder, N., Beisser, D., Hattab, G., Boenigk, J., & Heider, D.**, *Quantification of the covariation of lake microbiomes and environmental variables using a machine learning-based framework*, Molecular Ecology, 30(9), 2131-2144, doi.org/10.1111/mec.15872.

2021 **Wagner, D., Heider, D., & Hattab, G.**, *Mushroom data creation, curation, and simulation to support classification tasks*, Scientific reports, 11(1), 1-12, doi.org/10.1038/s41598-021-87602-3.

2021 **Hattab, G., Rhyne, T. M., & Heider, D.**, *Correction: Ten simple rules to colorize biological data visualization*, PLoS Computational Biology, 17(4), doi.org/10.1371/journal.pcbi.1008901.

2021 **Hufsky, F., Lamkiewicz, K., Almeida, A., Aouacheria, A., Arighi, C., Bateman, A., . . . , Hattab, G., . . . & Marz, M.**, *Computational strategies to combat COVID-19: useful tools to accelerate SARS-CoV-2 and coronavirus research*, Briefings in bioinformatics, 22(2), 642-663., doi.org/10.1093/bib/bbaa232.

2020   **Martin, R., Hackl, T., Hattab, G., Fischer, M. G., & Heider, D.**, *MOSGA: Modular Open-Source Genome Annotator*, Bioinformatics, 36 (22-23), 5514–5515, doi.org/10.1093/bioinformatics/btaa1003.

2020   **Hattab, G., Rhyne, T. M., & Heider, D.**, *Ten simple rules to colorize biological data visualization*, PLoS Computational Biology, 16(10), doi.org/10.1371/journal.pcbi.1008259.

2020   **Martin, R., Löchel, H. F., Welzel, M., Hattab, G., Hauschild, A. C., & Heider, D.**, *CORDITE: the curated CORona drug InTERactions database for SARS-CoV-2*, Iscience, 23(7), 101297, doi.org/10.1016/j.isci.2020.101297.

2020   **Hattab, G., Ahlfeld, T., Klimova, A., Koepp, A., Schuerer, M., & Speidel, S.**, *Uniaxial compression testing and Cauchy stress modeling to design anatomical silicone replicas*, Scientific Reports, 10(1), 1-7, doi.org/10.1038/s41598-020-68886-3.

2020   **Hattab, G., Ahlfeld, T., Klimova, A., Koepp, A., Schuerer, M., & Speidel, S.**, *Data from Uniaxial Compression testing and validation scripts for Cauchy stress modeling to design anatomical silicone replicas*, 10.24435/materialscloud:2020.0019/v2.

2020   **Hattab, G., Riediger, C., Weitz, J., & Speidel, S.**, *A case study: impact of target surface mesh size and mesh quality on volume-to-surface registration performance in hepatic soft tissue navigation*, International journal of computer assisted radiology and surgery, 15(8), 1235-1245, doi.org/10.1007/s11548-020-02123-0.

2020   **Hattab, G., Arnold, M., Strenger, L., Allan, M., Arsentjeva, D., Gold, O., . . . & Speidel, S.**, *Kidney edge detection in laparoscopic image data for computer-assisted surgery*, International journal of computer assisted radiology and surgery, 15(3), 379-387, doi.org/10.1007/s11548-019-02102-0.

2020   **Hattab, G., Meyer, F., Albrecht, R. D., & Speidel, S.**, *MODELAR: A MODular and EvaLuative framework to improve surgical Augmented Reality visualization*, The Eurographics Association, Eurographics & Eurovis 2020, 10.2312/evs.20201066.

2019   **Hattab, G., & Nattkemper, T. W.**, *SeeVis–3D space-time cube rendering for visualization of microfluidics image data*, Bioinformatics, 35(10), 1802-1804, doi.org/10.1093/bioinformatics/bty889.

2018   **Hattab, G.**, *Analyzing colony dynamics and visualizing cell diversity in spatiotemporal experiments*, Bielefeld University, (PhD, Doctor rerum naturalium).

2018   **Hattab, G., Wiesmann, V., Becker, A., Munzner, T., & Nattkemper, T. W.**, *A novel Methodology for characterizing cell subpopulations in automated Time-lapse Microscopy*, Frontiers in bioengineering and biotechnology, 6, 17, doi.org/10.3389/fbioe.2018.00017.

2017   **Hattab, G., Schlüter, J. P., Becker, A., & Nattkemper, T. W.**, *ViCAR: an adaptive and landmark-free registration of time lapse image data from microfluidics experiments*, Frontiers in genetics, 8, 69, doi.org/10.3389/fgene.2017.00069.

2016   **Hattab, G., Brink, B. G., & Nattkemper, T. W.**, *A mnemonic card game for your amino acids*, Emily Carr University of Art+Design, 1, 48, Information+ Conference.

2015   **Hattab, G., Warschawski, D. E., Moncoq, K., & Miroux, B.**, *Escherichia coli as host for membrane protein structure determination: a global analysis*, Scientific reports, 5(1), 1-10, doi.org/10.1038/srep12097.

2015   **Schlueter, J. P., McIntosh, M., Hattab, G., Nattkemper, T. W., & Becker, A.**, *Phase Contrast and Fluorescence Bacterial Time-Lapse Microscopy Image Data*, Bielefeld University, doi.org/10.4119/unibi/2777409.

2014   **Hattab, G., Moncoq, K., Warschawski, D., & Miroux, B.**, *Escherichia coli as host for membrane protein structure determination: A global analysis.*, Biophysical Journal, 106(2), 46a, doi.org/10.1016/j.bpj.2013.11.335.

2014   **Hattab, G.**, *Pattern recognition in a heat maze based spatial system adapted to Drosophila melanogaster*, Université Paris-Saclay. Université Paris Diderot Sorbonne., (Master of Science).

2014   **Hattab, G., Suisse, A. Y., Ilioaia, O., Casiraghi, M., Dezi, M., Warnet, X. L. . . . & Miroux, B**, *Membrane protein production in Escherichia coli: overview and protocols. Membrane Proteins Production for Structural Analysis*, Springer, 87-106, doi.org/10.1007/978-1-4939-0662-8_4.

2012   **Hattab, G.**, *Establishment of a bibliographic and bioinformatics mining tool to research the over-expression of heterologous membrane proteins*, Institute of Biological Physical Chemistry. Université Paris Diderot Sorbonne, (Bachelor of Science).

Selected conferences

2021   The 29th German Conference on Bioinformatics (GCB). Virtual (co-author one paper in proceedings)

2020   IEEE Visualization Conference (VIS). Salt Lake City, Utah, USA. (virtual attendee)

2020   The 28th German Conference on Bioinformatics (GCB). Frankfurt, Germany (co-author two papers in proceedings)

2020   Eurographics & Eurovis (EGEV) 2020. Norrköpping, SE (paper in proceedings)

2019   The 33rd International Conference on Computer Assisted Radiology and Surgery (CARS). Rennes, FR (workshop talk and co-organizer)

2018   The 9th International Conference on Information Processing in Computer-Assisted Interventions (IPCAI). Berlin, DE (event assistant)

2016   IEEE Visualization Conference (VIS). Baltimore, MD, USA (attendee)

2016   Information+ conference. Emily Carr University. Vancouver, BC, CA (highlight talk and exhibition)

2015   The 7th Gender summit (GS7): Mastering gender in research performance, contexts, and outcomes. Berlin, DE (attendee)

2015   Membrane Protein Structures 2015 Meeting (MPS): Advance Photon Source. Argonne National Laboratory. Lemont, IL, USA (abstract in proceedings)

2014   The 22nd German Conference on Bioinformatics (GCB). Bielefeld, DE (attendee)

2014   DYNAMO Labex Symposium: Evolution, biogenesis and dynamics of energy transducing membranes. Oceanographic Institute. Paris, FR (poster)

2014   Biophysical Society: 58th Annual Meeting. Biophys J 106 (2, Suppl 1): 46a. San Francisco, CA, USA. (poster and abstract in proceedings)

2013   Bioenergetics: Gordon Research Conferences. Proctor Academy. Andover, NH, USA (highlight talk).

Invited talks

2021   **Colloquium** 'Hidden Data Facets in Bioinformatics.' Colloquium for Bioinformatics and Systems Biology. (KoBiS) Kolloquium für Bioinformatik und Systembiologie Mittelhessen. University of Applied Sciences Middle Hesse. Giessen, Germany

2019   **Lecture** 'Visual Computing.' Institute of Simulation and Graphics (ISG), Otto von Guericke University Magdeburg. H. Theisel, B. Preim. Magdeburg, Germany

2019   **Workshop** '9th Summer School Surgical Robotics.' Laboratory of Computer Science, Robotics and Microelectronics Laboratory of Computer Science, Robotics and Microelectronics (LIRMM), CNRS. P. Poignet, N. Zemiti. Montpellier, France.

Teaching

2020-2021   **Lecture** Data Visualization. Bilingual (EN/DE). Department of Mathematics and Computer Science, University of Marburg. Marburg, Germany. Three consecutive semesters (3 SEM)

2020-2021   **Seminar** Biological Data Visualization. Department of Mathematics and Computer Science, University of Marburg. Marburg, Germany. 2 SEM

2021   **Seminar** Information Theory Tools for Visual Computing. Department of Mathematics and Computer Science, University of Marburg. Marburg, Germany. 1 SEM

2019   **Workshop** 'Perceptual Capacities and Constraints in AR/VR for the visualization of 3D biomedical image data.' Computer Assisted Radiology and Surgery (CARS). R. Eagleson, U. Eck, G. Hattab, B. Preim. Rennes, France

2015–2016   **Seminar** 'Visualization approaches for biological data (BioVITAL).' Faculty of Technology, Bielefeld University. Bielefeld, Germany. 2 SEM.

Refereeing Services and Scientific Committees

Reviewer:

2014–2021   *Oxford Bioinformatics, BMC Bioinformatics, BMC Biodata Mining, PLOS Computational Biology, Springer Science Information China, Elsevier Computational Science, International journal of Computer Assisted Radiology and Surgery.*

Board Member:

2019–2021   *Nightingale* The Data Visualization Society (Editorial).

2019-2021   *Department of Mathematics and Computer Science.* Philipps-Universität Marburg (Faculty).

2021   *Zentrum für Synthetische Mikrobiologie (SYNMIKRO).* Center for Synthetic Microbiology (Scientific).

Funding

2020-2021 **Center for Interdisciplinary Research**, *Zentrum für interdisziplinäre Forschung (ZiF)*, the 1th International Conference on Data Storage in Molecular Media (DSMM), Bielefeld, Germany, (funding awarded to organize the conference).

2019 **Intuitive Surgical Inc.**, *CARS Conference*, Rennes, France, (sponsorship awarded for the AR/VR 3D biomedical image data visualization workshop).

Awards

2017–2018 **Jump-start position**, *Bielefeld University, DFG GRK 1906*, Bielefeld, Germany, Funded position awarded to transition from a PhD to a Postdoc.

Skills & Competences

Programming & Scripting Python, Perl, C, C++, Mathematica, MATLAB, PL/PGSQL, PostgreSQL, xHTML, PHP, Javascript, R, LaTeX, ConTeXt

Other Data Mining, Computer Vision, Visualization, Unix

Languages

French	**native speaker**	–
English	**near native**	*CEFR (C2)*
German	**very good command**	*CEFR (B2)*
Arabic	**good command**	*CEFR (B1)*

References

Prof. Dr. Dominik Heider	dominik.heider@uni-marburg.de
Theresa-Marie Rhyne	theresamarierhyne@gmail.com
Prof. Dr. Ing. Tim W. Nattkemper	tim.nattkemper@uni-bielefeld.de
Prof. Dr. Tamara Munzner	tmm@cs.ubc.ca
Dr. Roland Wittler	roland.wittler@uni-bielefeld.de
Prof. Dr. Bruno Miroux	bruno.miroux@ibpc.fr