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Laura Garrison

Visualization Researcher and Designer

Main Interests

Data visualization and visual analytics, UI/UX design, scientific communication

Selected Professional Experience

- **Visualization Researcher**. *2018 - present*. University of Bergen and Mohn Medical Imaging and Visualization (MMIV) Centre, Bergen, Norway.

  My research focuses on developing new and more efficient techniques, based on UI/UX design and research principles, to analyze and visualize biomedical data. My end goal is to create tools that make this complex information easier to communicate and understand for both scientists and the general public. Funded Visual Data Science for Large Scale Hypothesis Management in Imaging Biomarker Discovery (VIDI) Project. Highlights include:

  - Published and presented internationally collaborative research in top visualization journals (*Transactions on Visualization and Computer Graphics, Computers & Graphics*) and awarded Best Poster at 2019 EuroVis Conference.
  - Invited speaker to BioMedSpring 2021 with an international panel of speakers to educate early career medical visualization scientists.
  - Supervised one master's student thesis project that led to an international conference presentation and journal publication (SpectraMosaic) and one bachelor-level group semester project (Chronic pain logging web application based on the McGill Pain Questionnaire)
  - Administrative and teaching-related duties for INF 100 (Introduction to Programming), INF 101 (Object-oriented programming), and INF 102 (Algorithms)

- **Scientific Technical Director.** *2016 - 18*. BioDigital, New York, NY.
  BioDigital is an interactive 3D software platform for visualizing human anatomy, disease, and treatment. Highlights of my time at BioDigital include:
  - Worked with the executive team to develop and manage the roadmap and best practices for content creation, management, and organization in the BioDigital Human.
  - Supervised the science team and oversaw the scientific and anatomical accuracy of the BioDigital online virtual human body platform.
  - Met with clients and worked with the content and engineering teams to develop scalable interactive 3D experiences that met the clients' communication needs while supporting the major initiative to grow BioDigital's internal content library.
  - Was part of an interdisciplinary team from academics and industry that was a finalist for the NIH HuBMAP grant
  - Co-presented the BioDigital Human at the 2018 VIZBI Poster session

- **Director of Medical Media**. *2013 - 15.* i-Human Patients, Inc. by Kaplan, Sunnyvale, CA.
  i-Human Patients, Inc. creates comprehensive simulated patient encounters for medical students and practicing medical professionals that provide unparalleled immersion in the learning environment. i-Human Patient case scenarios help users develop critical clinical skills and diagnostic accuracy while providing an effective tool for educators to evaluate individual and group competencies. Highlights of my time at i-Human include:
  - Oversaw creation, acquisition, and management of all media used in i-Human Patient products, including the production of virtual patient avatars and anatomically accurate illustrations. In this role I worked closely with other departments to quickly address media-driven bottlenecks for a diverse set of production deliverables.
  - Led the development with a distributed team comprising content specialists, engineers, and outside contractors of a systematically organized media library, incorporating over 4,000 media, including audio, video, illustrations, and radiographs, all with differing viewing requirements.
  - Oversaw corporate website, assisted with UI design of flagship products, and created marketing and communication materials for trade shows and conferences.
  - Traveled for key trade show and client meetings.

- **Production Artist**. *2013 - 14*. Emmi Solutions, Chicago, IL.
  Emmi Solutions is a healthcare communications company focused on empowering the patient to be more active in their healthcare decisions. Highlights of my time at Emmi include:
  - Planned and executed animation content and sequences for modules in collaboration with art and editorial directors and writers using Adobe Flash and Illustrator.
  - Started a daily drawing blog for the production artist group to experiment and improve drawing capabilities.

- **Medical illustration Intern**. *Spring 2012*. Journal of the American Medical Association, Chicago, IL.
  Medical illustration intern in partial satisfaction of my Master's degree in Biomedical Visualization from University of Illinois-Chicago for the *Journal of the American Medical Association* (JAMA). I worked within a fast-past production pipeline to create illustrations for JAMA's patient pages, scientific articles, and medical news briefs. My **artwork** from this time was published in the following JAMA articles:
  - Punnoose AR, **Schwartz (Garrison) LA**, Golub RM. JAMA patient page. Neonatal hyperbilirubinemia. JAMA. 2012 May 16;307(19):2115. Erratum in: JAMA. 2012 Aug 22;308(8):765. *doi: 10.1001/jama.2012.4070.*
  - Torpy JM, **Schwartz (Garrison) LA**, Golub RM. JAMA patient page. Urinary tract infection. JAMA. 2012 May 2;307(17):1877. *doi: 10.1001/jama.2012.3885.*
  - Torpy JM, **Schwartz (Garrison) LA**, Golub RM. JAMA patient page. Rosacea. JAMA. 2012 Jun 6;307(21):2333. *doi: 10.1001/jama.2012.3942*.
  - Torpy JM, **Schwartz (Garrison) LA**, Golub RM. JAMA patient page. Snakebite. JAMA. 2012 Apr 18;307(15):1657. doi: 10.1001/jama.2012.433.
  - Slomski A. US Can Draw Insight From Other Nations' Experiences With Evidence-Based Medicine. *JAMA*. 2012;307(15):1567–1569. *doi:10.1001/jama.2012.457*

- Srygley FD, Gerardo CJ, Tran T, Fisher DA. Does This Patient Have a Severe Upper Gastrointestinal Bleed? *JAMA*. 2012;307(10):1072–1079. *doi:10.1001/jama.2012.253*

Education
- **PhD Candidate in Visualization**. *2018 - present*. University of Bergen, Norway. Thesis: Designing task-based experiences for the visualization and visual analysis of physiological processes. Advisors: Dr. Stefan Bruckner, Dr. Renate Grüner
- **MS in Biomedical Visualization**. *2010 - 12*. University of Illinois at Chicago, IL.
- **BA in Anatomy/Physiology**, Art and Chemistry minors. with Full Honors. *2005 - 09*. Northern Michigan University, MI.

Awards
- Melzer Grant. University of Bergen 2020
- Best Poster Award. 2019 EuroVis Conference, Porto, Portugal
- Best Student Entry. Graphics Media. 2012 BioImages Annual Media Exhibition BioCommunications Association.
- Award of Excellence - Natural Science Illustration. 2012 BioImages Annual Media Exhibition. BioCommunications Association.
- Chancellor's Student Service Award. University of Illinois Chicago 2012
- Finalist in Image of Research Competition. University of Illinois Chicago 2012
- 1st place group poster. 2009 Student Celebration of Research and Creative works. Northern Michigan University
- Winner of design competition for 2009 U.P. 200 Dog Races logo, Marquette, MI.
- Benjamin A. Gilman Scholarship. Northern Michigan University 2007

Language Proficiency
- English - native
- Norwegian - medium working proficiency

Citizenship
- American
- Norwegian - skilled worker permit until 2022

Other Professional Activities
- Board Member. Vesalius Trust for Visual Communication in the Health Sciences. 2017 - present.
- Certified Medical Illustrator. Commission on Accreditation of Allied Health Education Programs. 2015 - present.
- Student Member. IEEE. 2018-present.
- Student Member. EuroGraphics 2018-present.
- IEEE TVCG External Reviewer. 2020-present
- EuroGraphics CGF External Reviewer. 2020-present
- Guest Researcher. Otto von-Guericke University Magdeburg, Germany. MedDigit research group. July 2019.
- President of Student Association of Medical Illustrators, University of Illinois at Chicago 2011-12

Scientific Publications

- **L. Garrison**, J. Müller, S. Schreiber, S. Oeltze-Jafra, H. Hauser, and S. Bruckner, "DimLift: Interactive Hierarchical Data Exploration through Dimensional Bundling," Accepted to appear in upcoming issue of IEEE Transactions on Visualization and Computer Graphics, 2021. *doi: 10.1109/TVCG.2021.3057519*
- J. Müller, **L. Garrison**, P. Ulbrich, S. Schreiber, S. Bruckner, H. Hauser, and S. Oeltze-Jafra, "Integrated Dual Analysis of Quantitative and Qualitative High-Dimensional Data," Accepted to appear in upcoming issue of IEEE Transactions on Visualization and Computer Graphics, 2021. *doi: 10.1109/TVCG.2021.3056424*
- **L. Garrison**, J. Vašíček, A. R. Craven, R. Grüner, N. Smit, and S. Bruckner, "Interactive Visual Exploration of Metabolite Ratios in MR Spectroscopy Studies," Computers & Graphics, vol. 92, p. 1–12, 2020. *doi: 10.1016/j.cag.2020.08.001*
- H. Bartsch, **L. Garrison**, S. Bruckner, A. Wang, S. F. Tapert, and R. Grüner, "MedUse: A Visual Analysis Tool for Medication Use Data in the ABCD Study," in Proceedings of VCBM 2019 (Short Papers), 2019, p. 97–101. *doi: 10.2312/vcbm.20191236*
- **L. Garrison**, J. Vašíček, R. Grüner, N. Smit, and S. Bruckner, "SpectraMosaic: An Exploratory Tool for the Interactive Visual Analysis of Magnetic Resonance Spectroscopy Data," in Proceedings of VCBM 2019, 2019, p. 1–10. *doi: 10.2312/vcbm.20191225*
- **L. Garrison**, J. Vašíček, R. Grüner, N. Smit, and S. Bruckner, A Visual Encoding System for Comparative Exploration of Magnetic Resonance Spectroscopy Data, 2019. Poster presented at the EuroVis conference 2019. *Best Poster Award*.

Invited Talks & Presentations

- **Upcoming** Visualization and Communication. BioMedSpring 17-21 May 2021.
- Hierarchical Visual Exploration of Clinical Cohort Data. MMIV Conference 2020: Enabling Imaging Technology to Transform Patient Care, Mohn Medical Imaging and Visualization Center, Norway, Dec. 10, 2020.
- Visual Data Science for Medicine. MMIV Seminar Series, Mohn Medical Imaging and Visualization Center, Norway, Feb. 20, 2020.
- Visual Imaging Biomarker Discovery for Neuroscience. MMIV Conference 2019: Convergence of Medical Data Science for Improved Patient Care, Mohn Medical Imaging and Visualization Center, Norway, Dec.10, 2019.
- A Visual Encoding System for Comparative Exploration of Magnetic Resonance Spectroscopy Data, MMIV Conference 2019: Convergence of Medical Data Science for Improved Patient Care - Posters, Mohn Medical Imaging and Visualization Center, Norway, Dec. 9-11, 2019.
- SpectraMosaic: An Exploratory Tool for the Interactive Visual Analysis of Magnetic Resonance Spectroscopy Data. ICT Research School, University of Bergen, Norway, Nov.1, 2019.
- SpectraMosaic: An Exploratory Tool for the Interactive Visual Analysis of Magnetic Resonance Spectroscopy Data. VCBM 19: Eurographics Workshop on Visual Computing for Biology and Medicine, Brno, Czech Republic, Sep. 4-6, 2019.
- An Exploratory Tool for the Interactive Visual Analysis of Magnetic Resonance Spectroscopy Data. Department of Neurology, Otto-von-Guericke University, Magdeburg, Germany. Aug. 6, 2019.

- A Visual Encoding System for Comparative Exploration of Magnetic Resonance Spectroscopy Data. 21st Eurographics Conference on Visualization, EuroVis 2019 - Posters, Porto, Portugal, Jun. 3-7, 2019.
- The BioDigital Human, Visual Computing Forum, Institute for Informatics, University of Bergen, Norway, Dec. 14, 2018.