Geoffrey F. Schau

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PERSONAL STATEMENT

My current professional and academic interests concern application of machine learning methods that integrate diverse biomedical data to improve our understanding of biology and disease.

FORMAL EDUCATION

Doctor of Philosophy in Biomedical Engineering 2020 (*expected*)
Oregon Health & Science University *Portland, Oregon, USA*

Master of Science in Electrical Engineering 2015
Portland State University *Portland, Oregon, USA*

Bachelor of Science in Biomedical Engineering 2012
Rose-Hulman Institute of Technology *Terre Haute, Indiana, USA*

PROFESSIONAL EXPERIENCE

BrighterBioDesigns 2019-present
Sole Proprietor *Portland, Oregon, USA*

Microsystems Engineering, Inc. 2012-2015
Applied Research Engineer *Lake Oswego, Oregon, USA*

RH Ventures, Inc. 2011-2012
Biomedical Engineering Intern *Terre Haute, Indiana, USA*

Boston Scientific, Inc. Summer, 2011
Manufacturing Engineering Intern *Arden Hills, Minnesota, USA*

PUBLICATIONS AND PREPRINTS

- **Schau, G.F.**, "Estimating Shared Information Content through Unsupervised Imaging-Omics Domain Translation at Single-Cell Resolution" (*in preparation*)

- **Schau, G.F.**, "Transfer Learning Approach to Predict Metastatic Origin from Histopathological Whole Slide Images" (*in preparation*)

- **Schau, G.F.**, Burlingame, E.A., Thibault, G., Anekpuritanang, T., Wang, Y., Gray, J.W., Corless, C., Chang, Y.H., "Predicting primary site of secondary liver cancer with a neural estimator of metastatic origin," *J. Med. Imag.* 7(1), 012706 (2020), doi: 10.1117/1.JMI.7.1.012706.

- Burlingame, E.A., McDonnell, M., **Schau, G.F.**, Thibault, G., Lanciault, C., Morgan, T., Corless, C., Gray, J.W., Johnson, B., Chang, Y.H., "SHIFT: virtual immunofluorescence staining of histologically-stained tissue by deep learning" (*under review*)

- Thibault, G., Riesterer, J., Stoltz, K., Loftis, K., **Schau, G.F.**, Stempinksi, E., Lopez, C., Chang, Y.H., Gray, J.W., "Computer Vision Techniques for Cancerous Cell Analysis in FIB-SEM Images", *Proceedings of Microscopy and Microanalytics*, Vol. 25, 2019

- **Schau, G.F.**, Dane, M., Thibault, G., Gray J.W., Heiser, L., Chang, Y.H., "Variational Autoencoding Tissue Response to Microenvironment Perturbation", *Proc. SPIE Medical Imaging*, Vol. 10949, 2019

- **Schau, G.F.**, "Device, Method, and Algorithm to Assess Changes in Cardiac Output via Intracardiac Impedance Monitoring" Master's Thesis, Portland State University, Portland, OR, USA, 2015.

ORAL PRESENTATIONS

- Unsupervised Morphology Learning for Single-Cell Sub-Population Detection, *CSBC-PSON Image Analysis Workshop*, Seattle, WA, USA, 2020

- Estimating Mutual Information Content of Biomedical Data Modalities through Self-Supervised Domain Translation, *NeurIPS Workshop: Learning Meaningful Representations of Life*, Vancouver, Canada, 2019

- Deep Neural Estimation of Metastatic Origin of Liver Cancer, *Frontiers of AI-Assisted Care Scientific Symposium (FAC)*, Stanford University, Palo Alto, CA, USA, 2019

- Predicting Primary Site of Secondary Liver Cancer with a Neural Estimator of Metastatic Origin (NEMO) *PacNow Quantitative Biology Symposium*, OHSU, Portland, OR, USA, 2019

- SHIFT.AI: Accelerated Imaging Analytics, *InventOR Pitch Competition*, Portland, OR, USA, 2019

- Deep Learning for Biomedical Domain Translation, *BME Seminar*, OHSU, Portland, OR, USA, 2019

- (*Invited Speaker*) Seeing More: Deep Learning in Biomedicine *BME Retreat*, Portland, OR, USA, 2019

- Variational Autoencoding Tissue Response to Microenvironment Perturbation, *SPIE Medical Imaging*, San Diego, CA, USA 2019

POSTER PRESENTATIONS

- Histological Feature Dissimilarity between Primary and Metastatic Cancer, *Oregon Bioengineering Symposium*, Oregon State University, Corvallis, OR, USA, 2019

- Histological Feature Dissimilarity between Primary and Metastatic Cancer, *IMO Workshop V9.0 Tumor Board Evolution*, Moffitt Cancer Center, Tampa, FL, USA, 2019

- Neural Estimation of Metastatic Origin, *NCI Mathematical Oncology/CSBC-PSON West Coast Symposia*, OHSU, Portland, OR, USA, 2019

- Deep Learning Approach for Assessment of Microenvironment Signals on Phenotypic State of Triple Negative Breast Cancer, *International Association of Breast Cancer Research*, Egmond An Zee, The Netherlands, 2019

- Principle Feature Manifolds of Multicellular Growth Response to Microenvironment Perturbation, *OHSU Research Week*, Portland, OR, USA, 2018

- SHIFT: Predicting Biomarker Distribution in Medical Images through Speedy Histopathological to Immunofluorescent Translation, *OHSU Commercialization Conference*, OHSU, Portland, OR, USA, 2018

- Developmental Discordance Analysis for Single-Cell RNA-seq, *Intelligent Systems for Molecular Biology*, Prague, Czech Republic, 2017

- Consensus Representation of Lineage Expression (CREoLE) for Single-Cell RNA-seq, *Intelligent Systems for Molecular Biology*, Orlando, FL, USA, 2016

SELECTED AWARDS

Learning Meaningful Representations of Life Workshop (NIH Travel Award)	2019
NeurIPS 2019 (Travel Award)	2019
Integrated Mathematical Oncology Workshop on Tumor Board Evolution (Travel Award)	2019
CSBC-PSON West Coast Symposium Junior Investigator (Team Award, $36,600)	2019
InventOR Impact Award ($5,000)	2019
OHSU Center for Spatial Systems Biomedicine to IABCR (Travel Award)	2019
OCTRI Biomedical Innovation Program Funding Award (Team Award, $40,000)	2018
AMIA National Student Design Competition (Team Award, 3rd place)	2016
National Library of Medicine Pre-Doctoral Fellowship	2015

TEACHING, MENTORING, AND SERVICE

Program Committee	Machine Learning in Computational Biology (MLCB)	2019
Team Lead	Simulation Team, CSBC Junior Investigator Project	2019
Lecturer	"Neural Networks in a Nutshell", OCSSB Lecture Series, *OHSU*	2019
Lecturer	"Deep Learning in Biomedicine", CDCB Lecture Series, *OHSU*	2018-2019
Judge	Intel Northwest Science Expo	2016-2018
Teaching Assistant	ECE 203: Analog Circuit Analysis, *Portland State University*	2015
Teaching Assistant	ECE 102: Engineering Programming, *Portland State University*	2015
Judge	FIRST Robotics Design Competition	2014-2017

INTELLECTUAL PROPERTY

Title	Application Number	Filing Date
Translation of Images of Stained Biological Material	62/787,088	December 31, 2018
Translation of Images of Stained Biological Material	62/885,777	August 12, 2019

SKILLS AND INTERESTS

Computational:	Python, PyTorch, Keras, R, MATLAB, bash, slurm, condor, LaTeX
Engineering:	Analog circuitry, machining, soldering, CAD, 3D printing
Interests:	Skiing, mountaineering, sailing, cooking, board games, oil painting, rock climbing

REFERENCES

Young Hwan Chang, PhD — PhD Mentor
Principal Investigator, Quantitative BioImaging Laboratory — *Oregon Health & Science University*
chanyo@ohsu.edu

Joe W. Gray, PhD — PhD Committee Member
Director, OHSU Center for Spatial Systems Biomedicine — *Oregon Health & Science University*
grayjo@ohsu.edu

Christopher Corless, MD, PhD — PhD Committee Member
Executive Director, Knight Diagnostic Laboratories — *Oregon Health & Science University*
corlessc@ohsu.edu