

# Geoffrey F. Schau

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## RESEARCH INTERESTS

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My current research interests concern the application of computational methods that integrate imaging and genomics data, particularly at single-cell resolution, in the context of cancer biology.

## FORMAL EDUCATION

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<b>Oregon Health &amp; Science University</b> <i>Doctor of Philosophy in Biomedical Engineering</i>	2020 ( <i>expected</i> ) Portland, Oregon, USA
<b>Portland State University</b> <i>Master of Science in Electrical Engineering</i>	2015 Portland, Oregon, USA
<b>Rose-Hulman Institute of Technology</b> <i>Bachelor of Science in Biomedical Engineering</i>	2012 Terre Haute, Indiana, USA

## PROFESSIONAL EXPERIENCE

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<b>BrighterBioDesigns</b> <i>Sole Proprietor</i>	2019-present Portland, Oregon, USA
<b>Microsystems Engineering, Inc.</b> <i>Applied Research Engineer</i>	2012-2015 Lake Oswego, Oregon, USA
<b>RH Ventures, Inc.</b> <i>Biomedical Engineering Intern</i>	2011-2012 Terre Haute, Indiana, USA
<b>Boston Scientific, Inc.</b> <i>Manufacturing Engineering Intern</i>	Summer, 2011 Arden Hills, Minnesota, USA

## PUBLICATIONS AND PREPRINTS

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- **Schau, G.F.**, “Estimating Shared Information Content through Unsupervised Imaging-Omics Domain Translation at Single-Cell Resolution” (*in preparation*)
- **Schau, G.F.**, “Levering Histological Feature Dissimilarity between Primary and Metastatic Cancers for the Prediction of Metastatic Origin” (*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 (NEMO)”, *BioRxiv*, 2019 (*under review*)
- 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

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- Unsupervised Morphology Learning for Single-Cell Sub-Population Detection, *CSBC-PSO 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

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- Histological Feature Dissimilarity between Primary and Metastatic Cancer, *IMO Workshop V9.0 Tumor Board Evolution*, Moffitt Cancer Center, Tampa, FL, USA, 2019
- Estimating Mutual Information Content of Biomedical Data Modalities through Self-Supervised Domain Translation, *NeurIPS Workshop: Learning Meaningful Representations of Life*, Vancouver, Canada, 2019
- Neural Estimation of Metastatic Origin, *NCI Mathematical Oncology/CSBC-PSO 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

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Integrated Mathematical Oncology Workshop on Tumor Board Evolution (Travel Award)	2019
NeurIPS Workshop: Learning Meaningful Representations of Life (Travel Award)	2019
CSBC-PSO 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

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

## INTELLECTUAL PROPERTY

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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

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<b>Computational:</b>	Python, R, MATLAB, bash, slurm, condor, Unity (VR), $\text{\LaTeX}$
<b>Engineering:</b>	Analog circuitry, machining, soldering, CAD, 3D printing
<b>Interests:</b>	Skiing, mountaineering, cooking, board games, oil painting, rock climbing

## REFERENCES

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<b>Young Hwan Chang, PhD</b> PhD Mentor	chanyo@ohsu.edu <i>Oregon Health &amp; Science University</i>
<b>Joe W. Gray, PhD</b> PhD Committee Member	grayjo@ohsu.edu <i>Oregon Health &amp; Science University</i>
<b>Laura M. Heiser, PhD</b> PhD Committee Chair	heiser@ohsu.edu <i>Oregon Health &amp; Science University</i>