Qiyuan (Isabelle) Hu
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SUMMARY

- Medical physicist and imaging scientist with a focus on developing artificial intelligence methods for quantitative medical image analysis
- Interdisciplinary collaborator working at the intersection of physics, computer science, medicine, and statistics
- Author of 3 publications in peer-reviewed journals including 2 first-author papers, and 4 conference proceeding papers

EDUCATION

University of Chicago Chicago, IL
PhD in Medical Physics Expected 2021
- American Association of Physicists in Medicine Graduate Fellowship: Awarded to one outstanding incoming doctoral student each year to support the first two years of graduate study
- American Association of Physicists in Medicine Expanding Horizons Travel Grant
- Graduate Council Travel Fund Award
- Biological Sciences Division Travel Award

Carleton College Northfield, MN
B.A., Physics, Mathematics. Graduated summa cum laude with distinction in Physics Sep. 2013 – Jun. 2017
- Patricia V. Damon Merit Scholarship: Awarded for a strong academic profile and extra-curricular accomplishment
- Dean's List in all academic years
- Exemplary Writing Portfolio
- Phi Beta Kappa First Year Prize

RESEARCH EXPERIENCE

University of Chicago, Committee on Medical Physics Chicago, IL
Doctoral Researcher Sep. 2017 – present
Topics: Artificial Intelligence for Medical Image Analysis for Breast Cancer Multiparametric MRI and COVID-19 Chest Radiography
Advisor: Maryellen Giger, PhD
- Develop novel computer vision methods using deep learning and conventional radiomics with human-engineered features for breast cancer diagnosis based on high-dimensional multiparametric MRI
- Establish large-scale COVID-19 chest radiography and computed tomography datasets and investigate artificial intelligence methods for COVID-19 diagnosis, prognosis, and treatment response
- Contribute to the NIH-funded Medical Imaging and Data Resource Center, an open-source medical imaging database

Mayo Graduate School, Department of Biomedical Engineering Rochester, MN
Summer Research Intern, Mayo Graduate School Summer Undergraduate Research Fellowship Jun. – Aug. 2016
Topics: Determining Human Observer Performance in Lung Cancer Screening CT
Advisor: Lifeng Yu, PhD; Cynthia McCollough, PhD
- Designed and performed a virtual clinical trial on lung cancer screening CT including 12 conditions, and analyzed human observer performance as a function of nodule size, nodule type, dose level, and reconstruction method
- Contributed to the development and validation of model observers and protocol optimization

MIT, Department of Electrical Engineering and Computer Science Cambridge, MA
Summer Research Intern, Kolenkow Reitz Fund for Undergraduate Research Jun. – Aug. 2015
Topics: Raman Spectroscopy of Low-Dimensional Electrical Biased Device
Advisor: Mildred Dresselhaus, PhD
- Designed and built an experimental set up and measured the Raman spectroscopy of a graphene p-n junction device
- Prepared ultrathin samples of GaTe, a novel 2-D material for electronic devices, to study its electrical properties

Carleton College, Department of Physics and Astronomy Northfield, MN
Independent Research Student and Summer Research Student 2014 – 2015
Topic: Schumann Resonance Measurement for noise analysis in LIGO's gravitational wave detection
Advisor: Nelson Christensen, PhD

- Designed a circuit to acquire and process electromagnetic signal obtained from noncommercial antennas
- Collected Schumann resonance signals in an outdoor low-noise environment and analyzed with power density spectral plots and spectrograms

SKILLS

Programming: Python, R, MATLAB, Java, Mathematica
Languages: English, Mandarin Chinese

PUBLICATIONS AND PRESENTATIONS

Journal Publications:

1. Hu Q, Whitney HM, Giger ML. "A deep learning methodology for improved breast cancer diagnosis using multiparametric MRI." *Scientific Reports* 10.1 (2020): 1-11.

2. Hu Q, Whitney HM, Giger ML. "Radiomics methodology for breast cancer diagnosis using multiparametric magnetic resonance imaging." *Journal of Medical Imaging* 7.4 (2020): 044502.

3. Gong H, Hu Q, Walther A, Koo CW, Takahashi EA, Levin DL, Johnson TF, Hora MJ, Leng S, Fletcher JG, McCollough CH. "Deep-learning-based model observer for a lung nodule detection task in computed tomography." *Journal of Medical Imaging* 7.4 (2020): 042807.

Select Proceeding Papers and Presentations (out of 6):

1. Hu Q, Whitney HM, Giger ML. "Using ResNet feature extraction in computer-aided diagnosis of breast cancer on 927 lesions imaged with multiparametric MRI." *Medical Imaging 2020: Computer-Aided Diagnosis.* Vol. 11314. International Society for Optics and Photonics (SPIE), 2020. (Proceeding paper. Oral presentation.)

2. Hu Q, Whitney HM, Giger ML. "Transfer Learning in 4D for Breast Cancer Diagnosis using Dynamic Contrast-Enhanced Magnetic Resonance Imaging." *arXiv preprint arXiv:1911.03022* (2019). The 33rd Neural Information Processing Systems Conference (NeurIPS) Machine Learning for Health Workshop (ML4H). Extended Abstract. Poster presentation.)

3. Hu Q, Whitney HM, Edwards A, Papaioannou J, Giger ML. "TU-HI-SAN2-9: Multiparametric breast MRI radiomics in distinguishing between benign and malignant breast lesions." *Medical Physics* Vol. 46. No. 6., 2019. American Association of Physicists in Medicine (AAPM). (Selected oral presentation in the Science Council session. Highlighted as best of AAPM at American Society for Radiation Oncology [ASTRO] 2019 annual meeting.)

4. Hu Q, Whitney HM, Edwards A, Papaioannou J, Giger ML. "Radiomics and deep learning of diffusion-weighted MRI in the diagnosis of breast cancer." *Medical Imaging 2019: Computer-Aided Diagnosis.* Vol. 10950. International Society for Optics and Photonics (SPIE), 2019. (Proceeding paper. Poster presentation.)

LEADERSHIP AND SERVICE

SPIE Student Chapter, University of Chicago
Vice President, 2019-2020; Treasurer and founding member, 2018
- Organized optics-related activities, such as outreach events, Fermi lab tour, guest speaker seminars, etc.

Mentoring and Teaching:
- Supervised 2 undergraduate summer research students
- Teaching assistant for 2 graduate courses: Physics of Radiation Therapy, Physics of Medical Imaging I Practicum
- Mentored first-year international graduate students in the Global Mentorship Network at University of Chicago

Outreach:
- Coached high school students in the Girls Who Code after-school program at Kenwood Academy
- Mentored high school students in the Women in STEM program at the University of Chicago Laboratory Schools

Review: Reviewer for journals including European Radiology, Journal of Medical Imaging, Journal of Magnetic Resonance Imaging, and IEEE Transactions on Biomedical Engineering.