ERICH HUANG

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RESEARCH AND WORK EXPERIENCE

6.2010 –	**Mathematical Statistician.** Biostatistics Branch – Biometric Research Branch, Division of Cancer Treatment and Diagnosis, National Cancer Institute – National Institutes of Health.
9.2005 – 5.2010	**Research Assistant to Professor Christopher Genovese.** Department of Statistics, Carnegie Mellon University.
9.2004 – 5.2010	**Teaching Assistant: Various Undergraduate and Graduate Statistics Courses.** Department of Statistics, Carnegie Mellon University.
5.2008 – 8.2008	**Biostatistics Summer Intern.** Early and Business Development, Genentech, Inc.
7.2005 – 8.2005; 7.2006 – 8.2006	**Summer Course Instructor: Experimental Design for Behavioral and Social Sciences (Stat 36-309) and Statistical Reasoning and Practice (Stat 36-201).** Department of Statistics, Carnegie Mellon University.
9.2001 – 12.2001; 9.2002 – 5.2004	**Teaching Assistant: Multidimensional Calculus (Math 164).** Department of Mathematics, University of Rochester.

EDUCATION

2010	**PhD in Statistics.** Carnegie Mellon University Dissertation: System-Oriented Characterization of the Human Primary Visual Cortex Committee: C Genovese (advisor), R Kass, C Shalizi, V Ventura, E Merriam (Center for Neural Sciences, New York University
2005	**MS in Statistics.** Carnegie Mellon University.
2004	**BS in Applied Mathematics with Minor in Music.** University of Rochester

PEER-REVIEWED JOURNAL PUBLICATIONS

Litière S, Isaac G, de Vries E, Bogaerts J, Chen A, Dancey J, Ford R, Gwyther S, Hoekstra O, **Huang E**, Lin N, Liu Y, Mandrekar S, Schwartz L, Shankar L, Therasse P, Seymour L (2019). "RECIST 1.1 for response evaluation apply not only to chemotherapy-treated patients but also to targeted cancer agents: A pooled database analysis". *Journal of Clinical Oncology* 37 (13), pg. 1102-1110.

Paller CJ, **Huang EP**, Leuchtefeld T, Masset HA, Williams CC, Zhao J, Gravell AE, Tamashiro T, Reeves SA, Rosner GL, Carducci MA, Rubinstein L, Ivy SP (2019). "Factors Affecting Combination Trial Success (FACTS): Investigators survey results on early-phase combination trials". *Frontiers in Medicine* 6 (122).

Huang EP, Lin FI, Shankar LK (2017). "Beyond correlations, sensitivities, and specificities: A roadmap for demonstrating utility of advanced imaging in oncology treatment and clinical trial design". *Academic Radiology* 24 (8), pg. 1036-1049.

Lin FI, **Huang EP**, Shankar LK (2017). "Beyond correlations, sensitivities, and specificities: Case examples of the evaluation of advanced imaging in oncology clinical trials". *Academic Radiology* 24 (8), pg. 1027-1035.

Vargas HA, **Huang EP**, Lakham Y, Ippolito J, Bhosale P, Mellnick V, Shinagare A, Anello M, Kirby J, Fevrier-Sullivan B, Freymann J, Jaffe C, Sala E (2017). "Radiogenomics of high grade serous ovarian cancer: Multi-reader multi-institutional study from the Cancer Genome Atlas Ovarian Cancer (TCGA-OV) Imaging Research Group". *Radiology* 285 (2), pg. 482-492.

Burnside ES, Drukker K, Li H, Bonaccio E, Zuley M, Ganott M, Net JM, Sutton EJ, Brandt KR, Whitman GJ, Conzen SD, Lan L, Ji Y, Zhu Y, Jaffee CC, **Huang EP**, Freymann JB, Kirby JS, Morris EA, Giger ML (2016). "Using computer-extracted image phenotypes from tumors on breast magnetic resonance imaging to predict breast cancer pathologic stage". *Cancer* 122 (5), pg. 748-757.

Li H, Zhu Y, Burnside ES, **Huang E**, Drukker K, Hoadley KA, Fan C, Conzen SD, Zuley M, Net JM, Sutton E, Whitman GJ, Morris E, Perou CM, Ji Y, Giger ML (2016). "Quantitative MRI radiomics in the prediction of molecular classification of breast cancer subtypes in the TCGA/TCIA data set". *Nature Partner Journals* Breast Cancer 2 (16012).

Li H, Zhu Y, Burnside ES, Drukker K, Hoadley KA, Fan C, Conzen SD, Whitman GJ, Sutton EJ, Net JM, Ganott M, **Huang E**, Morris EA, Perou CM, Ji Y, Giger ML (2016). "MR imaging radiomics signatures for predicting the risk of breast cancer recurrence as given by research versions of MammaPrint, Oncotype DX, and PAM50 gene assays". *Radiology* 281 (2), pg. 382-391.

Schwartz LH, Seymour L, Litière S, Ford R, Gwyther S, Mandrekar S, Shankar L, Bogaerts J, Chen A, Dancey J, Hayes W, Hodi FS, Hoekstra OS, **Huang EP**, Lin N, Liu Y, Therasse P, Wolchok JD, de Vries E (2016). "RECIST 1.1 – Standardization and disease-specific adaptations: Perspectives from the RECIST working group". *European Journal of Cancer* 62, pg. 138-145.

PEER-REVIEWED JOURNAL PUBLICATIONS (CONTINUED)

Schwartz LH, Litière S, de Vries E, Ford R, Gwyther S, Mandrekar S, Shankar L, Bogaerts J, Chen A, Dancey J, Hayes W, Hodi FS, Hoekstra OS, **Huang EP**, Lin N, Liu Y, Therasse P, Wolchok JD, Seymour L (2016). "RECIST 1.1 – Update and clarification: From the RECIST committee". *European Journal of Cancer* 62, pg. 132-137.

Huang EP, Wang X-F, Roy Choudhury K, McShane LM, Gönen M, Ye J, Buckler AJ, Kinahan PE, Reeves AP, Jackson EF, Guimaraes AP, Zahlmann G, for the Meta-Analysis Working Group (2015). "Meta-analysis of the technical performance of an imaging procedure: Guidelines and statistical methodology". *Statistical Methods in Medical Research* 24 (1), pg. 141-174.

Obuchowski NA, Reeves AP, **Huang EP**, Wang X-F, Buckler AJ, Kim HJ, Barnhart HX, Jackson EF, Giger ML, Pennello G, Toledano AY, Kalpathy-Cramer J, Apanasovich TV, Kinahan PE, Myers KJ, Goldgof DB, Barboriak DP, Gillies RJ, Schwartz LH, Sullivan DC, for the Algorithm Comparison Working Group (2015). "Quantitative imaging biomarkers: A review of statistical methods for computer algorithm comparisons". *Statistical Methods in Medical Research* 24 (1), pg. 68-106.

Shinagare AB, Vikram R, Jaffe C, Akin O, Kirby J, **Huang E**, Freymann J, Sainani N, Sadow CA, Bathala TK, Rubin D, Oto A, Heller MT, Surabhi VR, Katabathina V, Silverman SG (2015). "Radiogenomics of clear cell renal cell carcinoma: Preliminary findings of the Cancer Genome Atlas Renal Cell Carcinoma (TCGA-RCC) Research Group". *Abdominal Imaging* 40 (6), pg. 1684-1692.

Sullivan DC, Obuchowski N, Kessler LG, Raunig DL, Gatsonis C, **Huang EP**, Kondratovich M, McShane LM, Reeves AP, for the Radiological Society of North America Quantitative Imaging Biomarkers Alliance (RSNA-QIBA) Metrology Working Group (2015). "Metrology standards for quantitative imaging biomarkers". *Radiology* 277 (3), pg. 813-825.

Polley MC, Polley EC, **Huang EP**, Freidlin B, Simon R (2014). "Two-stage adaptive cutoff (TACO) design for building and validating a prognostic biomarker signature". *Statistics in Medicine* 33 (29), pg. 5097-5110.

Gutman DA, Cooper LAD, Huang SN, Holder CA, Gao J, Arora TD, Dunn Jr. WD, Scarpace L, Mikkelson T, Jain R, Wintermark M, Jilwan M, Raghavan P, **Huang E**, Clifford RJ, Mongkolwat P, Kleper V, Freymann J, Kirby J, Zinn PO, Moreno CS, Jaffe C, Colen R, Rubin DL, Saltz J, Flanders A, Brat DJ. "MR imaging predictors of molecular profile and survival: Multi-institutional study of the TCGA glioblastoma data set". *Radiology* 267 (2), pg. 560-569.

Huang EP, Fridlyand J, Lewin-Koh N, Yue P, Shi X, Dornan D, Burington B (2010). "Statistical techniques to construct assays for identifying likely responders to a treatment under evaluation from cell line genomic data". *Biomed Central Cancer* 10 (586).

PEER-REVIEWED JOURNAL PUBLICATIONS (CONTINUED)

Beer LB, Sahin H, Bateman NW, Blazic I, Vargas HA, Veeraraghavan H, Kirby J, Fevrier-Sullivan B, Freymann JB, Jaffe CC, Brenton J, Miccó M, Nougaret S, Darcy KM, Maxwell GL, Conrads TP, **Huang E**, Sala E. "Integration of proteomics with CT-based qualitative and texture features in high-grade serous ovarian cancer patients: An exploratory analysis". Under review at *European Radiology*.

Veeraraghavan H, Vargas HA, Jimenez-Sanchez A, Miccó M, Mema E, Lakhman Y, Crispin-Ortuzar M, **Huang EP**, Levine DA, Grisham RN, Abu-Rustum N, Deasy JO, Snyder A, Miller ML, Brenton JD, Sala E. "Predicting high-grade serous ovarian cancer treatment outcomes using radiomic, genomic, and clinical variables: A retrospective study". Under review at *PLOS Medicine*.

Huang EP, Shih JH. "Assigning readers to cases in multi-reader multi-case imaging studies using balanced incomplete block designs". Under review at *Statistical Methods in Medical Research*.

PRESENTATIONS

11.29.2020	**Invited Oral Presentation:** "Data for developing and validating AI and machine learning algorithms" for the featured presentation "Creating publicly accessible radiology imaging resources for machine learning and AI". *Radiological Society of North America (RSNA) Annual Meeting* (virtual).
12.4.2019	**Invited Oral Presentation:** "Statistical methodology for the integration of imaging and proteomics" for the educational course "Imaging in proteomics research". *Radiological Society of North America (RSNA) Annual Meeting*, Chicago, IL.
12.4.2019	**Invited Oral Presentation:** "Multivariate quantitative imaging biomarkers: A framework for estimating and testing technical performance" for the Quantitative Imaging Biomarkers Alliance (QIBA) Working Meeting. *Radiological Society of North America (RSNA) Annual Meeting*, Chicago, IL.
7.29.2019	**Invited Oral Presentation:** "Assigning readers to cases in multi-reader multi-case imaging studies using balanced incomplete block designs" for the session "Recent advances in the design and analysis of multi-reader imaging studies". *Joint Statistical Meetings*, Denver, CO.
5.17.2018	**Invited Oral Presentation:** "From exploratory to clinically useful: Dos and don'ts for imaging test validation". *Quantitative Imaging Network (QIN) Annual Meeting*, Rockville, MD.
12.1.2016	**Invited Oral Presentation and Panel Discussion:** "Statistical considerations for the analysis of imaging data from the Cancer Imaging Archive" for the educational course "Imaging integration with cancer genomics/proteomics: Methodologies leveraging the Cancer Imaging Archive". *Radiological Society of North America (RSNA) Annual Meeting*, Chicago, IL.

PRESENTATIONS (CONTINUED)

5.13.2014   **Contributed Poster:** "Validating human-made tumor characterizations based on diagnostic images for prognosis and disease management decision in the clinic". *The Cancer Genome Atlas (TCGA) Symposium*, Bethesda, MD.

11.29.2011   **Contributed Poster:** "A novel statistical method for lossless compression of diagnostic imaging features". *Radiological Society of North America (RSNA) Annual Meeting*, Chicago, IL.

4.6.2010   **Contributed Poster:** "Statistical methods for a system-oriented characterization of the human primary visual cortex". *Annual Banquet of the American Statistical Association (ASA)*, Pittsburgh, PA.

3.31.2009   **Contributed Poster:** "Simultaneous estimation of response fields and impulse response functions". *Annual Banquet of the American Statistical Association (ASA)*, Pittsburgh, PA.

PROFESSIONAL ACTIVITIES

Committees   Response Evaluation Criteria in Solid Tumors (RECIST) Committee (Member, 2012 –)

National Cancer Institute Clinical Imaging Steering Committee (Member, 2010 –)

American College of Radiology Imaging Network (ACRIN) Data Safety and Monitoring Committee (Ex-officio member, 2010 –)

Referee Service   *Journal of the National Cancer Institute*

Journal of Neuro-Oncology

Statistics in Biopharmaceutical Research

HONORS AND AWARDS

2004   National Science Foundation VIGRE Fellowship: full tuition plus $1800 per month stipend for each semester of graduate school

Inducted into Phi Beta Kappa

Graduated Magna Cum Laude from the University of Rochester (final GPA: 3.90/4.00)

2003   Inducted into Golden Key National Honor Society

TECHNICAL SKILLS

Statistical Software	R/S-plus, Matlab, SPSS, Minitab
Programming	C, HTML, UNIX shell scripting
Document Preparation	LATEX, Microsoft Office, OpenOffice
Operating Systems	UNIX/LINUX, Microsoft Windows, Mac OS X

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