Zongchao Liu

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EDUCATION

Mailman School of Public Health, Columbia University *New York, USA*

Master of Science in Biostatistics *Expected May.2021*

School of Public Health, Shandong University *Jinan, China*

Bachelor of Medical Science in Preventive Medicine *Sep.2014 – Jun.2019*

School of Population and Public Health, University of British Columbia *Vancouver, Canada*

Exchange student *Jul.2017 - Dec.2017*

SKILLS

Knowledge: Statistical Learning & Deep Learning, Data Structure and Algorithms, Statistical Inference, Real Analysis, Epidemiology, Survival Analysis, Longitudinal Analysis, Computational Statistics, Biochemistry, Cell Biology, Genetics

Technical: Python, R, SAS, Neo4j, MATLAB, EpiData, LaTeX, Git version control

Language: Fluently both orally and written in English, Cantonese and Mandarin

RESEARCH EXPERIENCE

Department of Mental Health Data Science, NYSPI *Mar. 2020 – present*

Graduate Research Assistant *New York, USA*

- Designed a computational procedure for cleaning and matching controls in customized ratio for the Adolescent Brain Cognitive Development (ABCD) Study
- Conducted experiments with 3D VGG and Resnet structures to predict CBCL-attention score from 3D DTI FA maps under different scenarios. Embedded knockoff and integrated gradient methods into the predictive model to interpretably select features from diffusion tensor brain imaging data with control of false discovery rate

Department of Epidemiology, Columbia University *Aug. 2020 – present*

Graduate Research Assistant *New York, USA*

- Developed R and SAS scripts to map ICD-10-CM codes into general and sub-level Clinical Classification categories for pediatric inpatients from the Kids' Inpatient Database (KID)
- Developed a procedure to filter patients with diagnosis of Autism Spectrum Disorder (ASD) based on the attained categories. Calculated their comorbidity conditions association (adjusted- and specific- standardized morbidity ratios) with ASD
- Conducted a hierarchical clustering analysis to differentiate selected patients into different subgroups and investigated on the distributive patterns of the comorbidities within the subgroups

Research Center for Public Health, Tsinghua University *Jul. 2020 – present*

Graduate Research Assistant *Beijing, China*

- Investigated on distributional patterns of Chinese college students' casual sexual relationship (CSR) as well as the associated risk factors, and quantitatively evaluated the risk by combining data of behaviors and attitudes towards CSR
- Conducted clustering analysis to formalize predictors for predicting the occurrence of CSR via gradient boosting machine. Explored and ranked factors of sociodemographic, health behaviors, and awareness in predicting occurrence of CSR by constructing a Bayesian Addictive Regression Tree model

Guangdong Institute of Gastroenterology *Jun. 2019 – Aug. 2020*

Research Assistant *Guangzhou, China*

- Developed Python scripts for automatically matching and correcting patients' information, as well as extracting radiomics features from CT, MRI images by customized filters
- Conducted feature selection process and used selected features to build predictive models including random forest, gradient boosting machine, support vector machine to predict the pathological complete response (pCR) in patients with rectal cancer after neoadjuvant treatment

Department of Biostatistics, Shandong University *Jan.2018 – Jun.2019*

Research Assistant *Jinan, China*

- Constructed an improved gray model (1,1) to predict the incidence rates of cervical cancer and endometrial carcinoma from 2018 to 2020 in Shandong, verifying other previous prediction of the incidence rates
- Conducted an epidemiology study by presenting the crude, age-standardized and urban(rural) incidence rates of cervical cancer and endometrial carcinoma in Shandong Province, 2013~2017
- Designed and constructed Diabetes Knowledge Graph using Neo4j by coding specific nodes and relationships including the complete process for screening, diagnosis, treatment, and education

PUBLICATIONS AND PRESENTATIONS

- Zhuang Z., **Liu Z.#,** Wang X., et al. Radiomics analysis of computed tomography for predicting pathological response to neoadjuvant treatment in rectal cancer: Post-hoc Analysis of a Randomized Controlled Trial [J]. *Frontiers in Oncology Gastrointestinal Cancers.* 2020, under review
- Hu B., Li R., **Liu Z.,** et al. Insight into the Hospital-based Low-medium Intensity Rehabilitation on Postoperative Outcome in Patients with Total Knee Arthroplasty: A Prospective Randomized Study [J]. *Knee Surgery, Sports Traumatology, Arthroscopy.* 2020, under review
- **Liu Z.,** Lin Z., Cao W., Encoding Chinese College Students' Hookup Culture: Prevalence and Characteristics. *Manuscript in preparation*
- **Liu Z.,** Lin Z., Ranking sociodemographic, health behavior, and awareness in predicting occurrence of casual relationship among college students: A Bayesian machine learning approach. *Manuscript in preparation*
- **Liu Z.,** Li G., Excess comorbidities associated with autistic spectrum disorder diagnosis in pediatric hospital discharge records, *Manuscript in preparation*
- **Liu Z.**, Wang S., Ge Y. (Aug 10, 2017). "Global Health Issues on Childhood Obesity" Poster session presented at Undergraduate Research Conference at University of British Columbia, Vancouver.

RELEVANT COURSEWORK PROJECTS

- Fragility Index for Clinical Trials
- A Simulation Study to Compare Two Bootstrapping Methods for propensity-score matching
- Implementation and optimization of algorithms on cancer diagnosis dataset
- Analyses of daily COVID-19 cases across nations
- A Bayesian model of hurricane trajectories

RELEVANT WORK EXPERIENCES

Qingdao Center for Disease Control and Prevention *Qingdao, China*

Staff Intern *Feb. 2019 – Jun. 2019*

Shandong Qianfoshan Hospital *Jinan, China*

Staff Intern *May. 2017 - Jul. 2017*

HONORS & AWARDS

Outstanding Graduates *2019*

Excellent Student Scholarship *2015-2019*

Member of China Anti-cancer Youth Committee *2018*

Member of the Elite Class, Chinese Academy of Sciences *2018*

First Prize, Shenzhen Cup Mathematical Modeling Competition *2016*

Bronze Award, Information Technology and Entrepreneurship Competition *2017*