

# FAN WANG

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## EDUCATION

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### University of Toronto

PhD Candidate in Statistical Sciences

Thesis title: A Flexible Summary-based Colocalization Method  
to Integrate Omics Data

Supervisors: Dr. Lisa Strug and Dr. Lei Sun

Sept. 2016 - Present

Expected defence in spring 2022

### University of Toronto

Honors BSc in Statistics & Actuarial Science

Sept. 2012 - Apr. 2016

## INTERESTS & SKILLS

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**Research Interests:** Statistical genetics; Integrative analysis of omics data; Gene or set-based testing; Genome-wide association study; High dimensional data analysis.

**Programming Skills:** Proficiency in R; Familiar with HPC compute cluster, linux system, Python and Matlab.

**Genetic Softwares:** Frequent user of PLINK, CAVIAR, eCAVIAR, COLOC2, SMR, LocusFocus, etc.

## PUBLICATIONS

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1. **Wang, F.**, Panjwani, N., Cheng, W., Sun, L., & Strug, L.J. (2021). A flexible summary-based colocalization method with application to the mucin Cystic Fibrosis lung disease modifier locus. *bioRxiv*. (*Under revision at The American Journal of Human Genetics*)
2. Panjwani, N., **Wang, F.**, Mastromatteo, S., Bao, A., Wang, C., He, G., Gong, J., Rommens, J.M., Sun, L., & Strug, L.J. (2020). LocusFocus: Web-based colocalization for the annotation and functional follow-up of GWAS. *PLoS computational biology*, 16(10), e1008336.
  - *A web-based tool that sees over 100 new users per month according to Google Analytics*
  - *Selected as highlight for the month in November 2020 by the International Genetic Epidemiology Society (IGES)*
3. Gong, J.\*, **Wang, F.\***, Xiao, B.\*, Panjwani, N., Lin, F., Keenan, K., Avolio, J., Esmaili, M., Zhang, L., He, G., Soave, D., Mastromatteo, S., Baskurt, Z., Kim, S., O'Neal, W.K., Polineni, D., Blackman, S.M., Corvol, H., Cutting, G.R., Drumm, M., Knowles, M.R., Rommens, J.M., Sun, L., & Strug, L.J. (2019). Genetic association and transcriptome integration identify contributing genes and tissues at cystic fibrosis modifier loci. *PLoS Genetics*, 15(2), e1008007. (*\*joint first author and developed methodology*)
4. Yao, F., Sue-Chee, S., & **Wang, F.** (2017). Regularized partially functional quantile regression. *Journal of Multivariate Analysis*, 156, 39-56.

## EXPERIENCE

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**Research Associate, Strug Lab, The Hospital for Sick Children**  
Toronto, ON, Canada

Apr. 2017 - Present

- Conducted colocalization analyses and gene-based tests for cystic fibrosis, which identified several disease-relevant genes and contributing organs.
- Developed theoretical and computational basis for the statistical software *LocusFocus*, which integrates omics data from multiple sources (i.e. GTEEx, GWAS). Specific tasks include designing the statistical model, producing the computational framework in R and optimizing the software for efficiency.

## Visiting Scholar, Peking University

July. 2021 - Present

*Beijing, China*

- Collaborated with Prof. Fang Yao to develop a new detection algorithm for high-dimensional signal region detection with applications to whole genome association studies (GWAS).
- Assisted in applying the statistical framework for conducting GWAS on UK Biobank data.
- Extended the statistical framework in differential gene expression analysis (DGE), including analyzing the GTEx data and conducting method comparisons (i.e. NOISeq).

## Research Assistant, University of Toronto

Sept. 2016 - Apr. 2017

*Toronto, ON, Canada*

- Worked with Prof. Fang Yao to develop a regularized partially functional quantile regression model with high-dimensional scalar covariates.
- Developed a nonparametric regression adopted with locally weighted penalized regression model for spatial-temporal data with irregular domains and non-smooth edges.
- Performed simulation studies and derived theoretical properties of regression estimators.

## TALKS & PRESENTATIONS

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1. Genetics & Genome Biology Seminar, The Hospital of Sick Children, Toronto, ON., Canada, “**Co-localization Analyses Inform Responsible Genes at GWAS Loci: Example at a CF Modifier Locus**”, Jan. 2021.
2. CANSSI Ontario STAGE, University of Toronto, Toronto, ON., Canada, “**Co-localization Methods**”, Mar. 2019.
3. The American Society of Human Genetics (ASHG) Annual Meeting, Poster presentation, San Diego, CA., America, “**Co-localization analyses provide counterintuitive findings: Application to cystic fibrosis lung disease**”, Oct. 2018.
4. The American Society of Human Genetics (ASHG) Annual Meeting, Poster presentation, Orlando, FL., America, “**A unified framework for gene-based and multi-trait colocalization testing: Application to cystic fibrosis**”, Oct. 2017.

## HONORS & FELLOWSHIPS

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- **Trainee of the CANSSI-Ontario STAGE training program** Sept. 2021 - Present
- **Doctoral Completion Award** 2021  
University of Toronto, CA\$4,500/year
- **University of Toronto Excellence Award** May. 2015 - Sept. 2015  
CA\$6,000

## PEER REVIEWS

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Journals:

*PLOS ONE*

2021

*Genetic Epidemiology*

2020

## LEADERSHIP & TEACHING EXPERIENCES

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- **Teaching Assistant** for three graduate level and three undergraduate level courses, including Statistical Genetics, Methods of Applied Statistics, etc. Sept. 2016 - Sept. 2020
- **Vice President**, Statistical Science Association of Students Sept. 2015 - Sept. 2016
- **Course Instructor** in Bluekey Education, teaching undergraduate level statistical science courses, including Methods of Data Analysis, Probability and Statistics, etc. Sept. 2015 - Sept. 2016