

Wenyu Nie

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Vancouver

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Empowering EdTech with Educational Data Science | Psychometrician

Education Background

M.S. in Data Science

Department of Computer Science

Aug 2023 - Jul 2024

University of British Columbia

- Advanced machine learning and statistical inference techniques
- Industry-level real-life data science projects

Research M.S. in Brain and Cognitive Sciences

Amsterdam Brain and Cognition Center

Sep 2015 - Sep 2017

University of Amsterdam

- Related Coursework: Programming with R and Matlab, Programming for Data Visualization, Structural Equation Modeling, Network Analysis, Modeling for Cognition and Neuroscience, Meta Analysis, Item Response Theory

B.S. in Psychology

Department of Psychology

Sep 2011 - Jun 2015

Wuhan University

- Related Coursework: Advanced Math(with Calculus), Psychological Statistics(with Probability Theory), Multivariate Statistics, Matlab, C, C++, Java, Experimental Designs, Research Methods in Psychology, Psychometrics

Recent Working Experience

Senior Recommendation Algorithm Engineer (Psychometrician)

Measurement Team, DATA-EDU Department

Jun 2021 - Present

ByteDance

(numerical results not included for reasons of confidentiality)

- game-based assessment for talent evaluation
 - feature engineering on behavioral event tracking for higher-level features
 - factoring ability structures and clustering student profiles from behavioral features
 - developing data pipelines and scoring APIs for ability estimation and test result reporting
 - ad-hoc analysis and reporting of the validity and reliability of this innovative test format
- stealth assessment for K12 and language learning
 - developing bayesian IRT models and algorithms for balancing exploitation and exploration of model parameters
 - designing the architecture for online model training and T+1 parameter fine-tuning
 - deploying recommendation and scoring data pipelines and APIs for accurate assessment

Measurement Algorithm Engineer (Psychometrician)

Measurement and Adaptive Learning Team, AI Platform Department

Sep 2019 - Apr 2021

VIPKID EdTech

- computerized adaptive testing
 - building the item bank and test scale for adaptive testing based on item response and partial credit models
 - deploying adaptive item push and ability estimation APIs for placement and growth tests
 - analyzing and monitoring the effectiveness of adaptive testing implementation
 - completion rate 32% increase, conversion rate 56% increase, course matching rate to 91%
 - collaborating with international cooperators to develop the adaptive version of third-party tests
- intelligent tutoring system
 - implementing cognitive diagnosis models (CDM) for iterating and validating knowledge structures
 - deploying APIs for personalized item recommendation, ability estimation, and diagnostic reporting
 - building student profiles with CDM and deep knowledge tracing models on historical response data
 - auc 0.84, negative sample recall rate 75%
 - designing recommendation strategies on top of student models to improve student performance
 - 6.49% improvement in learning efficacy compared to the control group
 - engineering quasi-real-time pipelines for model update and developing APIs for recommendation

Educational Data Researcher

Measurement Team, Technical Department

Sep 2018 - Sep 2019

AL07 EdTech

- measurement for the educational content of the company
 - carrying out daily psychometric tasks such as item analysis, anchor design, and pilot test design
 - solving large dataset parameter estimation problems for common scale development
 - cooperating with international partners for frontier measurement research and linking studies
- adaptive placement test
 - debugging and upgrading the adaptive testing algorithm based on IRT, conversion rate 13% increase
 - analyzing and visualizing data for test quality evaluation and reporting
 - presenting data insights to toB clients such as public schools and educational institutes

Relevant Skills

- **Modeling:** machine learning(scikit-learn,pytorch), bayesian statistics(edward,pyro), optimization(e.g.EM,VI,MCMC)
- **Data Analysis:** Python(e.g.pandas,seaborn), R(e.g.tidyverse,dplyr,ggplot2,shiny), SQL scripting
- **Development:** frameworks(flask,fastApi,plumber,pygrpc,C++grpc), storage(mongodb,redis), CICD(git,docker,linux)
- **Languages:** English(IELTS8), Mandarin, Cantonese, Japanese(JLPT-N1)

Selected Research and Patents

Measurement Models - CN Patent Pending 202210483864.8 - A model for dynamic bifactor item response theory.

Recommendation System - CN Patent Pending 202210483865.2 - An item recommendation method balancing exploitation and exploration based on information entropy.

Nie, W., Sui, Y., & Yu, W. (2014). Effect of Learner Control on Time Perception, *Chinese American Educational Research and Development Association International Conference*