Zipeng Wang

Tel: +8613810367735; Email: 18377067@buaa.edu.cn

EDUCATION

Beihang University 2018.9-2022.6

- Major: Information Management and Information System
- GPA: **89.7/100**

PUBLICATION

- A Documents Clustering Method Based On Heterogeneous Graph Structure,Zhang Junhuan,Wang Zipeng,Chinese Science & Technology Resources Review

INTERNSHIP

Research on Knowledge Graph Fusion
Institute of Software, Chinese Academy of Sciences
NLP Intern, led by Jun Hu 2021.4 - 2021.7

- Extracted knowledge maps from five data sources (Wikipedia, Baidu Encyclopedia, WeChat Official Accounts, Army Recognition website, and OpenKG website), arranged and got fused data set of knowledge maps for the UAV field based on this
- Studied the entity alignment model of decision tree based on balanced sample weight, trained model and made it gain more than 90% average F1 value in multifold cross validation, proving the effectiveness of the model
- Wrote the review of knowledge graph fusion and crowdsourcing technologies respectively
- Attended the evaluation task of the China Conference on Knowledge Graph and Semantic Computing (CCKS 2021)

RESEARCH EXPERIENCE

Cross-platform Technology Resource Aggregation and Large-scale Service Space Construction
Research on Document Clustering Analysis Based on Heterogeneous Graph Structure
National Key Research and Development Program, supervised by Junhuan Zhang 2020.6 - 2021.1

- Combined with the heterogeneous graph model and the meta-path based method, proposed a new clustering analysis method for scientific and technological resources literature, which could fully grasp papers' textual information and flexibly and accurately show the interrelation among papers
- Established a heterogeneous graph network containing four types of entity as nodes, namely paper, author, journal and keyword, and used the meta-path based method to extract key information from heterogeneous graphs into isomorphic images involving only the same nodes for analysis
- Took Chinese literature in the field of artificial intelligence from 2000 to 2009 as an example, constructed a document network map with the conceptual entity as the document and a keyword network map with the conceptual entity as the keyword
- Extracted the paper networks including the same author, journal and keyword from the heterogeneous graph network, realized the similar literature recommendation using the node similarity, and conducted literature visualization and clustering with PCA+t-SNE method and k-means algorithm
- Extracted the keyword networks from the heterogeneous graph network, utilized spectral segmentation algorithm for keywords network clustering, found the research in the field of artificial intelligence

mainly included the optimization algorithm, expert system, neural network, rough set theory, and agent theory, and obtained the five directions in research period changes of the degree of attention

CONTEST

Mathematical Contest in Modeling 2020.2

Analysis of A Football Team's Teamwork Based on Pass Network and Player Competence Model

- Won Honorable Mentions
- Founded a basic pass network model with players as its nodes and pass routes as its arcs
- Constructed the average pass network to describe average figures of each match and the dynamic 50 pass network to describe the real-time dynamics of the match, analyzed the properties of the two networks to understand the overall strategic preferences of Huskies and successfully identify Huskies' high-value pass motifs by properly setting thresholds
- Defined the successful defence ratio, pass turnover ratio, and shot pass ratio as indicators of the players' defensive, passing and offensive capabilities respectively, analyzed the data and tried to represent a player's ability with a set of indicators
- Wielded ordinal utility theory to link the pass network model with the player competence model together, and concluded what degree a player or a motif was overrated or underrated
- Tried to apply our models and methods to general situations

2020 National University Students Mathematics Modeling Contest 2020.9

Research on The Optimal Strategy of "Crossing The Desert" Game

- Won The First Prize of Beijing
- Considered weather conditions, number of players, map information and other factors to study the optimal strategy of "crossing the desert" game
- Given weather condition and sole contestant: employed dynamic programming method to solve accurately, simplified the diagram, and abstracted the key nodes and key sections, greatly reducing the cost of the algorithm
- Random weather conditions: built the decision-making model based on weather probability, made the maximum expected return as decision-making target, acquired optimal strategy under any weather probability, and considered continuous bad weather condition, introduced the "emergency procedures" to timely monitor some probability of players and help them make the right decisions and timely avoid risk
- Two players and known weather: introduced a game model and searched Nash equilibrium to determine the optimal strategy
- Three players and unknown weather: applied Q-learning method to give a solution

COMPUTER SKILLS

- Proficient in C, Python, SQL, PyTorch

HONORS AND AWARDS

- University-level Studies Excellent Scholarship (Three Times) 2018, 2019, 2020
- University-level Discipline Competition Scholarship (Three Times) 2018, 2019, 2020
- The National First Prize of "Foreign Graduate Cup" English Reading Contest 2019.12
- Third Prize in National English Competition for College Students 2019.4