JIA HE

SUN

PROSPECTIVE PH.D. STUDENT

RESEARCH INTERESTS

My current research interests lie in novel machine learning applications, especially in the following areas: optimization, operations research, and games.

CONTACT

https://www.jhsun.info/
Website

+1 (613) 809-8322
Phone Number

Jh.sun@mail.utoronto.ca
Email

SKILLS

LATEX
PYTHON
MICROSOFT OFFICE
TENSOR FLOW
SQL
GUROBI

RESEARCH

PDFs are available on my website

A SEMI-SUPERISED LEARNING APPROACH TO EFFICIENT CUT SELECTION IN THE BRANCH-AND-CUT FRAMEWORK — 2023

International Conference on Computational Science
Jia He Sun, Salimur Choudhury

Contributions: Designed an efficient and highly generalizable cut selection scheme for the branch-and-cut framework for mixed integer programming. Implemented a deep classification model augmented with unsupervised pre-training using tensorflow. Implemented a branch-and-cut simulation program to produce a dataset of size ~10,000 using Coin-OR (python). Implemented various common heuristics to evaluate the proposed model.

Semi-Supervised Learning | Mixed Integer Programming | Branch-and-Cut | Cut Selection

COMPUTATIONAL COMPLEXITY AND ICONIC FUNCTIONS OF MORPHOPHONOLOGICAL PROCESSES — 2022

Workshop on Model Theoretic Representations in Phonology
Olivia Griffin, Jia He Sun

Contributions: Modelled forms of verbs as ordered trees. Modelled meanings of verbs as sets. Evaluated the computational complexity of different morphophonological processes. Proved processes with more complex forms correlate to those with more complex meanings using computational complexity.

Computational Linguistics | Language Iconicity | Language Model | Complexity Analysis

AN ONLINE FAIR RESOURCE ALLOCATION SOLUTION FOR FOG COMPUTING — 2022

International Journal of Parallel, Emergent, and Distributed Systems
Jia He Sun, Salimur Choudhury, Kai Salomaa

Contributions: Designed a novel fog computing resource allocation scheme based on the generalized Dominant Resource Fairness (DRF) metric in a multi-resource, multi-server, online, heterogeneous task assignment environment. Implemented a resource allocation simulation program in python to evaluate the proposed allocation scheme.

Fog Computing | Resource Allocation | Optimization Problem | Heuristic

A MULTI-OBJECTIVE TASK ASSIGNMENT SOLUTION FOR PARKED VEHICULAR COMPUTING — 2022

International Conference on Operations Research and Enterprise Systems
Jia He Sun, Salimur Choudhury, Kai Salomaa

This paper proposes a task offloading system with a novel multi-objective formulation of the task offloading problem in Parked Vehicular Computing (PVC). A stable matching-based heuristic is proposed and evaluated at various configurations of the computing environment.
Contributions: Designed a novel multi-objective formulation of the task assignment problem in PVC. Proposed a stable matching-based algorithm and proved the stability of the output. Implemented a task assignment simulation program in Gurobi (python) to evaluate the performance of the proposed algorithm.
Edge Computing | Task Offloading | Optimization Problem | Heuristic| Stable Matching

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TENSOR FLOW
SQL
GUROBI

EDUCATION

QUEEN'S UNIVERSITY 2020 - 2022
Computer Science – 4.09/4.33 Master of Computing Science

Co-supervised By: Salimur Choudhury & Kai Salomaa
Main Research Area: Designing algorithms for optimization problems in next-generation computing paradigms
Relevant Courses: Reinforcement Learning (A), Neural and Genetic Computing (A), Paradigms of Wireless & Mobile Networks (A), Computing Beyond Turing (A+)

UNIVERSITY OF WATERLOO 2016 - 2020
Combinatorics and Optimization – 73% Bachelor of Mathematics (Honours)

Relevant Courses: Introduction to Combinatorics and Optimization, Computational Discrete Optimization, Network Flow Theory, Algorithmic Game Theory, Scheduling

HOBBIES