

Postdoctoral Associate (Design human-machine systems
for scheduling and allocating resources)
Singapore-MIT Alliance for Research and Technology
(SMART) Centre

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Posted May 9, 2024, set to expire Sep. 7, 2024

Job Title	Postdoctoral Associate (Design human-machine systems for scheduling and allocating resources)
Department	Mens, Manus and Machina—How AI Empowers People, Institutions and Cities in Singapore (M3S) Interdisciplinary Research Group (IRG) https://smart.mit.edu/research/m3s/about-m3s
Institution	Singapore-MIT Alliance for Research and Technology (SMART) Centre Singapore, Singapore, Singapore
Date Posted	May 9, 2024
Application Deadline	Open until filled
Position Start Date	Available Immediately
Job Categories	Post-Doc
Academic Field(s)	Transportation Engineering Industrial & Systems Engineering Computer Science
Job Website	https://portal.smart.mit.edu/careers/career-opportunities/job-application?job=512&job_cat=Job
Apply Online Here	https://portal.smart.mit.edu/careers/career-opportunities/job-application?job=512&job_cat=Job
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Job Description	

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Project Overview

The "Mens, Manus and Machina—How AI Empowers People, Institutions and Cities in Singapore (M3S)" project is driven by the goal of investigating the nature of work, redefining our relationship with technology, and exploring how institutions can adapt to foster livability, sustainability, innovation, and social welfare.

Successful applicants will have the opportunity to work on cutting-edge projects that aim to develop state-of-the-art AI to create future smart cities. The Postdoctoral Associate is in the T7 project for the five-year M3S program in SMART. The SMART team seeks to advance the frontier of AI research, apply it to society and cities, and demonstrate the concrete social impacts of the AI algorithms with broad public acceptance in Singapore.

Specifically, the T7 project concerns the design of human-machine systems for the scheduling and allocation of valuable resources in ways that accommodate and optimize for the needs and capabilities of both humans and machines; it uses the stand allocation process at Changi airport as a paradigm of a broad set of other potential application contexts.

The problem of scheduling and allocating valuable resources appears in numerous contexts (e.g., transportation, health, public services, logistics) and scales. Many of these contexts share a set of common features. First, decisions regarding scheduling and allocation must be made in the face of uncertainty about the amount and timing of demand for these resources. This, in turn, means that plans must be updated dynamically as new information comes in. Moreover, a variety of stakeholders are typically involved and contend for the limited available resources, so that decision-makers must look for compromise solutions that "optimize", in some way, the use of the resources, while balancing, to the extent possible, the requirements, priorities and social, economic, or demographic characteristics of these stakeholders. In short, these are complex problems involve multiple agents making multi-attribute decisions in a dynamic environment in the presence of uncertainty. Increasingly, AI- and ML-based tools are being brought by large organizations to bear on these problems and complement the expertise and experience of human managers and operators and the traditional decision-making support offered by more traditional (often large-scale) optimization models and algorithms. Optimizing human-machine interactions, training of humans and anticipating and mitigating potential societal, ethical, privacy and transparency issues related to these new tools are all critical aspects of the design of this next generation of scheduling and resource allocation systems.

The SMART-T7 team is led by distinguished scholars, i.e., Professor Hamsa Balakrishnan, Professor

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Amedeo Odoni, and Professor Jason Jackson from MIT, and Professor Hai Wang from Singapore Management University.

Job Description

- Collaborate with the project team and other researchers to design, implement, and evaluate research projects.
- Publish research results in top-tier conferences and journals, and disseminate research findings through presentations and other means.
- Participate in the mentorship and training of graduate and undergraduate students at MIT and in Singapore.
- Assist in grant writing, project management, and other administrative duties related to research activities.
- Perform other duties as needed.

Job Requirements

- Ph.D. in Operations Research, Industrial Engineering, Computer Science, Artificial Intelligence, Transportation Engineering, Network Science, Statistics, or a related field by the start of the appointment.
- Experience in integer and combinatorial optimization, large-scale optimization, machine learning, statistical modeling, network analysis, and/or algorithms.
- Experience in behavioral/optimization models, and their integration with AI.
- Strong publication record in top-tier conferences and journals.
- Excellent communication and collaboration skills.

To apply, please visit our website at: <https://portal.smart.mit.edu/careers/career-opportunities>

Interested applicants are invited to send in their full CV/resume, cover letter and list of three references (to include reference names and contact information). We regret that only shortlisted candidates will be notified.

Contact Information

Please reference Academickeys in your cover letter when

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applying for or inquiring about this job announcement.

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