

NATIONAL SCIENCE FOUNDATION
Proposal Abstract

Proposal:1936857

PI Name:Mahapatra , Nihar

Proposal Title: Convergence Accelerator Phase I (RAISE): AI-Based Decision Support for Linking Workers with Future Jobs and for Planning Work Transition and Career Pathway

Institution: Michigan State University

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The NSF Convergence Accelerator supports team-based, multidisciplinary efforts that address challenges of national importance and show potential for deliverables in the near future.

The broader impact/potential benefit of this Convergence Accelerator Phase I project relate to the ways in which it will help American workers, employers, and the overall economy face the impact of Artificial Intelligence (AI) and related automation technologies on the future of work. It is estimated that by 2030 about 14% of the global workforce may need to change occupational categories as the world of work is disrupted by technological advances. Many current workers and those entering the workforce lack skills that in-demand jobs and jobs of the future require. Addressing this challenge requires a holistic understanding of occupational categories and characteristics, their interrelationships and changes over time, worker characteristics, and how to connect workers to future jobs and help them transition from one type of work to another and plan their career pathway. Our project involves convergent research in AI, data science, and optimization, industrial and organizational psychology - specifically, person-job fit, person-environment fit, employee selection and bias, and human resources - specifically, workforce training and career planning. It will leverage partnerships with a diversity of stakeholders: government organizations, academia, industry, civilian, and military - to inform our research and define objectives and deliverables that are suitable for transitioning to practice.

This Convergence Accelerator Phase I project incorporates three elements to transform decision support for linking workers with future jobs and for job transition, training, and career planning. First, we propose a rich, holistic, fine-grained view of worker characteristics and job, occupation, and cross-occupation characteristics suitable for processing by data-driven AI systems. Second, we capture interrelationships between different types of jobs as tasks and other characteristics can overlap or be closely related. Third, we propose a data-driven detailed model created in the form of an occupation knowledge graph to provide AI-based decision support in career transitions and planning, by capturing the temporal changes in jobs and their characteristics. We utilize various natural language processing, deep learning, information extraction, and optimization methods to develop these elements. The anticipated results will yield a knowledge graph with a rich semantic understanding of the relationship between concepts associated with different occupations, a model to assist organizations in identifying workers for particular roles, positions, and work contexts, and a career planning toolkit. These all tie into the occupational challenges that the current and future workforce faces with advances in AI and related technologies.

This award reflects NSF's statutory mission and has been deemed worthy of support

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through evaluation using the Foundation's intellectual merit and broader impacts review criteria.