

NATIONAL SCIENCE FOUNDATION  
**Proposal Abstract**

**Proposal:**1937037

**PI Name:**Ding , Huiling

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**Proposal Title:** Convergence Accelerator Phase I (RAISE): Developing Intelligent Technologies for Workforce Empowerment: Credential Gap Diagnostics and Personalized Recommenders for Jobs and Retr

**Institution:** North Carolina State University

**Abstract Date:** 07/30/19

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 results from its focus on the integration of research, innovation, and education to address societal challenges. It will develop new Artificial Intelligence (AI) technologies and innovative educational modules to tackle upskilling, reemployment, and AI ethics on multiple fronts. We will build scalable recommendation systems to enhance the public infrastructure of upskilling and reemployment, increase academia-industry partnerships, and develop multidisciplinary educational modules on ethics, transferrable soft skills, and job application strategies in the era of AI recruitment. Our interdisciplinary team brings expertise in computer science, industrial engineering, technical communication, philosophy, healthcare, and psychology. Our goal is to provide reemployment support by developing a free, accessible prototype of a personalized AI-driven user interface to help current and future workers with retraining and upskilling. Integrating diverse perspectives through academia-industry-community partnerships, we will develop, test, and evaluate public-facing credential gap diagnostics, interview probability analytics, and reskilling and job recommendation systems. A publicly accessible web portal will be provided as the central clearinghouse for all research and teaching materials. Success in this project will enable us to build a "Google of reemployment preparation and upskilling" for future workers and a "service supermarket Uber" for retraining programs.

This Convergence Accelerator Phase I project aims to develop what we know to be the first public-facing AI platform that assists individual workers with upskilling and reemployment in a labor market increasingly characterized by automation, technological disruption, and AI recruiting. To start a retraining revolution, we will develop, implement, and test, on real-world data, a novel set of natural language processing, data mining, machine learning, and matching algorithms. Meanwhile, cutting-edge research will be conducted on AI ethics, AI-assisted recruiting, and soft skill transfer to address the challenges of workforce empowerment. Focusing on manufacturing, this project will develop reemployment support for machine operation, an occupation predicted to lose about 20% jobs to automation by 2026. It trains innovative AI tools with data about job responsibilities, competences, skills, occupations requiring complementary skills, and geographically scattered retraining resources. These AI tools then automate credential gap diagnostics and interview probability analysis before delivering personalized recommendations. This project promises to advance the frontier of workforce empowerment, professional communication, and AI ethics with scalable technical solutions, natural language processing, algorithm audits, and ethics reviews. A prototype of the AI-driven toolkit will be implemented to explore the technical

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requirements and scalability of AI-assisted workforce empowerment.

This award reflects NSF's statutory mission and has been deemed worthy of support through evaluation using the Foundation's intellectual merit and broader impacts review criteria.