

NATIONAL SCIENCE FOUNDATION  
**Proposal Abstract**

**Proposal:**1936915

**PI Name:**Woolf , Beverly

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**Proposal Title:** RAISE: C-Accel Pilot-Track B1:DIRECT: A Framework for Diagnosis, Recommendation, and Training in Continuous Workforce Development

**Institution:** University of Massachusetts Amherst

**Abstract Date:** 07/29/19

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 is to provide a software tool to guide individual workers in the US manufacturing workforce through the process of job selection and upskilling in their entire career. Due to the rapid development of workplace technology, such as robots and computer interfaces to machinery, future jobs require skills that are not taught in schools or standard training programs. Therefore, worker reskilling and retraining as part of the lifelong learning process is critical to the US economy and is a topic of national importance. The investigators will study this problem by collecting and analyzing data from a large partner corporation in the manufacturing industry and interviewing real workers and stakeholders; the proposed approaches will be tested by workers both employed by the partner corporation and recruited by a local partner city government. The investigators will integrate their expertise on computer science, educational technology, and social and economic analyses of the labor market to propose an effective, fair, and scalable software solution that can help a broad segment of workers in the US workforce, in both the manufacturing industry and beyond.

This Convergence Accelerator Phase I project aims at ultimately developing a framework that performs worker profile Diagnosis, training program RECommendation, and intelligent Training platform development (DIRECT) for the purpose of continuous workforce development. DIRECT is an integrated software tool that helps workers identify desirable future jobs, recommends training programs, and guides workers through the process of planning future career paths. It consists of four consecutive and intertwined components: (i) a skill level diagnosis and assessment component that uses cognitive models to assess worker skill levels from on-job data, (ii) a training experience development component that uses intelligent tutoring concepts to help workers acquire new skills, (iii) a skill gap identification component that uses labor market analysis to identify high-demand jobs and the skill gaps between a worker and their desirable job, and (iv) a future job and training program recommendation component that uses predictive artificial intelligence algorithms to connect workers to future jobs and select training programs to acquire the necessary skills. In Phase I of the project, the investigators will work with industry and government partners to formulate concrete research problems, identify data sources, develop prototypes, and conduct pilot studies to ensure that DIRECT is effective and practical.

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

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