

# NATIONAL SCIENCE FOUNDATION

## Proposal Abstract

Proposal:1937068

PI Name:Garn , Myk

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**Proposal Title:** Convergence Accelerator Phase I (RAISE): Competency Catalyst

**Institution:** Georgia Tech Research Corporation

**Abstract Date:** 08/01/19

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 the ability to educate and reskill America's workforce as 5G, Artificial Intelligence (AI), automation, big data, and cloud technology are replacing existing jobs with ones requiring new skills ranging from soft skills to rapidly evolving STEM specialties. The project will leverage infrastructure from national competency-based credentialing, education, training, and workforce development initiatives to develop an AI-based tool that will permit schools, employers, and training programs to deploy competency-based approaches with relative ease and without sacrificing local context and vocabulary. The project team includes educators, data scientists, software developers, workforce specialists, policy makers, and data professionals. The open source / open data tools developed will digitally connect educational programs to job market demands in ways that allow students and educators to adjust their programs to current and future needs in real time and allow local employers to align their needs with national demands and to influence the supply side of the talent pipeline. These tools will be used to improve education, counseling, reskilling, and hiring in a cross-sector multidisciplinary network, starting with dozens of educational institutions and hundreds of employers in the financial/tech market in the state of Georgia.

This Convergence Accelerator Phase I project advances the state-of-the-art in applying AI, open data, and analytics to competency-based education and workforce development. It contributes to the fields of computational linguistics, open data, and competency management while facilitating new methods for analyzing and aligning the job market with formal and informal training and education. AI algorithms will be developed for extracting demand-side skills and competencies from job descriptions, documents, and published competency models and for interpreting them in local educational or workforce contexts. Techniques include an array of semantic and text analysis methods; the use of domain-specific ontologies; and combining concept, entity, and relation detection algorithms (e.g., variants on bidirectional Convolutional Neural Networks with Long Short-Term Memory) with word and concept embedding layers to classify skills. All data will be exposed as linked open data with associated concept schema for further contextualization and with data governance that meets employer, educator and user requirements. The project will engage employer/education partnerships to design end-user dashboards that produce competency-based views of local and national job markets, of education and training experiences, and to pilot methods for improving the responsiveness and effectiveness of educational programs to job market needs.

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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