



NSF Convergence Accelerator's 2022 Cohort Phase 2 Award

Project Title

Intelligent 5G Networks Designed and Integrated for Globalized Operations (INDIGO)

Awardee

AT&T Corp.

Award/Contract

49100422C0020

Award Contract Type

R&D

Award Date

July 15, 2022

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NSF Funded Program

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PROJECT ABSTRACT

The Intelligent 5G Networks Designed and Integrated for Globalized Operations or INDIGO project aims to enhance the security, adaptability, and resilience of 5G networks for the Department of Defense (DoD) and public safety entities during crises. It employs Human-Centered Artificial Intelligence to enhance human decision-making to configure and manage complex 5G networks and optimize coverage and performance across multiple operator radio access networks. The system will integrate zero trust capabilities for security, including centralized authentication, real-time vulnerability management, traffic encryption, threat detection, and attack mitigation. These technologies and tools, designed for crisis situations, align with the missions of the DoD and public safety departments, but also have relevance for commercial mobile network operators and consumer services. The AI-enabled multi-operator approach can respond swiftly in disaster scenarios to restore and optimize 5G communications, potentially saving lives and reducing devastation.

INDIGO – a convergence research project involving experts from various sectors, such as computer science, military, physical and social sciences, and engineering – advances 5G/NextG Open Radio Access Network (O-RAN) and DoD technologies. The solution emphasizes a multi-operator orchestration approach to transform non-cooperative networks into optimizable cooperative ones, leveraging the O-RAN architecture and novel service abstractions. It also uses a range of techniques including spectrum monitoring, performance measurement, and automated credential provisioning for best-available, context-dependent security. As a longstanding influential member of the Telecommunications ecosystem, AT&T understands the power of new technology in solving community and societal challenges. The project's outreach and broadening participation plan involves offering educational programs, mentorship, and research experiences for K-12 and undergraduate students, particularly those from underrepresented groups, and providing STEM toolkits for teachers in New York City, supplemented by informal outreach activities such as demos, talks, and coding camps.