PRESS RELEASE

THE FIREFIGHTING HELMET IS GETTING A NEXT GEN UPGRADE

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Researchers at the Texas Tech Department of Industrial, Manufacturing, and Systems Engineering program are reinventing the iconic traditional firefighter helmet. Researcher are creating a NextGenHelmet improving on the iconic design and traditional materials of today's firefighter helmet through a generous $562,253 grant from the United States Department of Homeland Security. Dr Suman Chowdhury and his research team are seeking out fire departments throughout the United States who wish to participate in this first of its kind upgrade of the firefighter helmet. The team's research and prototype fabrication will focus on heat resistance utilizing the latest state of the art materials and technology combined with the latest military grade ballistic protections along with existing communication and lighting systems.

Today's firefighters utilize the iconic traditional firefighting helmet with its recognizable long brim worn toward the back of the neck. With the excessive temperatures faced by firefighters in countless emergency scenarios, a helmet that is heat resistant and well fitted is key to personal protection and injury prevention. In addition, the roles and responsibilities of firefighters have changed significantly over the past decades. Firefighters are increasingly called upon to respond to active shooter incidents and other hostile events. Therefore, utilizing a material that is ballistic resistant protects firefighters from ballistic projectile impacts in countless scenarios.

The traditional firefighter helmet was first used and invented by Henry T. Gratacap, a luggage maker by trade and volunteer of the Fire Department of New York City around 1836. The reinforced dome and tall front shield recognized in the traditional firefighter's helmet protected the firefighter from falling debris and was designed for breaking windows for rescues and ventilation. Little has changed in this traditional design over the past 150 years. These helmets were first made of leather, then brass, and later stronger metals to protect the firefighter from heat and falling debris. However, injuries were still very common, and over 150 years later - the design is inherently much the same.

By combining the latest military ballistic technology and current state of the art thermal resistant materials, Dr. Chowdhury and his research team envision a NextGenHelmet offering more protection, usability, affordability, and complete redesign with today's firefighter in mind. "We want to make a prototype with the highest level of protection, but one with useability and comfort that firefighters want and the affordability that fire departments need."

Dr. Chowdhury and his research partners, Dr. Greg McKennan of North Carolina State University Chemical Engineering Department - providing the ballistic prevention technology needs and Dr. Weilong Cong of the Texas Tech Industrial, Manufacturing Systems Engineering Department – providing materials testing will examine solutions to improve upon existing elements of firefighter helmet systems.

"This NextGenHelmet is intended to provide both fire and ballistic protections as well as supporting ancillary accessories such as communication devices, face shield, and lighting devices to bring firefighting helmet protections into the twenty first century. The current materials used in both

firefighting and military helmets are inadequate for a combination of temperature and ballistic resistant protection. We hope to combine these latest heat resistant and ballistic resistant technologies in a firefighting helmet that is highly functional as well as lightweight for wearability to create a piece of protection equipment that is useable and affordable," said Chowdhury.

"Challenges such as muscle fatigue, center of gravity, physical mobility, personal fit are just a few of the innovations that we hope improve upon in this next gen redesign of the helmet."

There are four challenges that Chowdhury aims to meet in this innovative research as firefighters and fire departments are sought out to aid in the testing and developing of this NextGenHelmet. "First, we will evaluate the existing helmet design for effectiveness and injury prevention. Second, the exploration of the most suitable materials design and ballistic protections with latest technology in compliance with the National Institute of Justice Standards and IIIA ballistic protection will be key. Third, we will develop a digital impact test to simulate ballistic and falling debris dangers that firefighters face. Last, is the fabrication and testing of the newly designed firefighter prototype helmet based on Finite-Element (FE) modeling platform as well as ballistic and thermal testing protocols."

This NextGenHelmet will meet these challenges and lead to a multipurpose firefighting helmet that protects firefighters from ballistic and falling debris as well as high heat while incorporating communication and lighting systems to facilitate functionality, mobility, visibility, and stability during firefighting events.

Firefighters and fire departments in the United States who are interested in participating in this first of its kind innovation of the firefighter helmet may contact Dr. Chowdhury and his research team at the Texas Tech Department of Industrial, Mechanical, and Systems Engineering Department at 806-742-3543 or by emailing Suman.Chowdhury@ttu.edu.