Missouri Academic Perspectives on the Maneuver Support Science and Technology Conference

Mike Nichols
Vice President for Research and Economic Development
University of Missouri

K. Krishnamurthy
Vice Provost for Research
Missouri University of Science and Technology

Perspectives

"The University of Missouri ought to be the growth engine of the state in developing the economy."

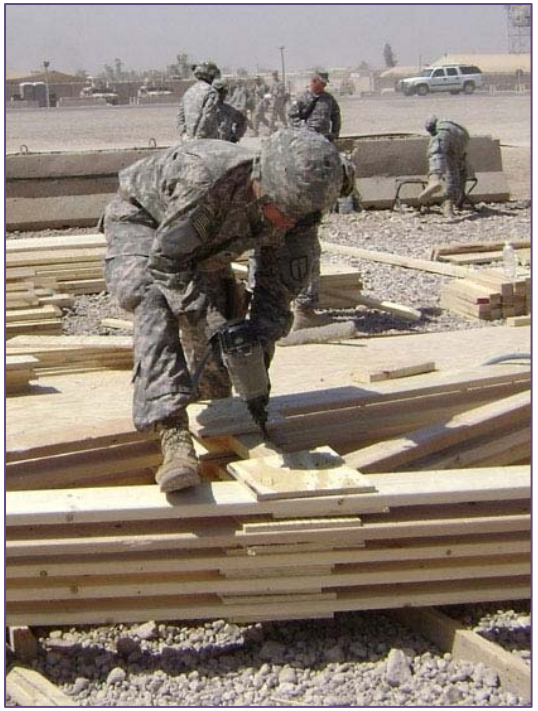
- UM President Gary Forsee

What We Hear

- Consequence management – Protection – Assured Mobility
  - Who do we have that really understands this problem and will respond?
  - What specific things can we do that are helpful?
  - How will we get licensed and resourced to engage?

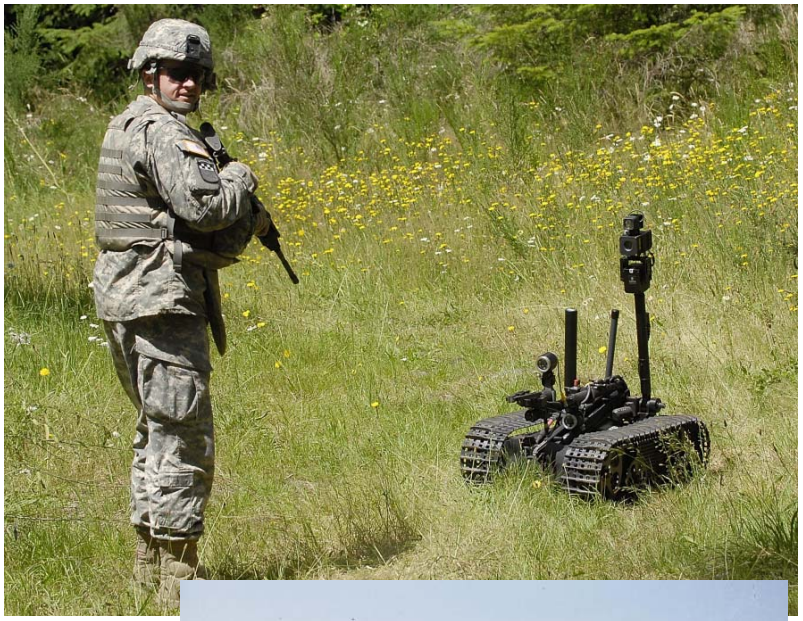
What We Hear

- Military Consequence Management
- Human Systems Integration
- Detect CBRNE weapons



What We Hear

- Detect, Identify and Neutralize IEDs
- Forward Operating Base Electric Micro Grid
- Minimize Environmental Impact



Research Alliance of Missouri (RAM)

- RAM is part of the Missouri Technology Corporation (MTC), which is a private not-for-profit corporation established by law with being a focal point for leading the state's efforts in technology based economic development and for enhancing the system for transferring new discoveries into the marketplace in order to create companies and high tech jobs for Missourians.

Research Alliance of MISSOURI

MISSOURI TECHNOLOGY CORPORATION

Research Alliance of MISSOURI

- RAM is composed of the chief research officers of higher education institutions, non-profit research institutions and the Missouri Department of Economic Development

- University of Central Missouri
- University of Missouri System
- Northwest Missouri State University
- University of Missouri-Columbia
- Saint Louis University
- University of Missouri-Kansas City
- Southeast Missouri State University
- Missouri University of Science and Technology
- Missouri State University
- University of Missouri-St. Louis
- Truman State University
- Washington University
- A.T. Still University
- Donald Danforth Plant Science Center
- Kansas City University of Medicine and Biosciences
- Stowers Institute for Medical Research

Research Alliance of MISSOURI

- RAM was established for purposes of enhancing the economic development of Missouri through research, technology commercialization and assistance to the state’s business community.

MLSRB

MISSOURI LIFE SCIENCES RESEARCH BOARD

- Missouri General Assembly allocated $13.4M to the Life Sciences Research Trust Fund in 2007 and 2008.
- In 2008, research with a focus on agriculture research, animal science, plant science, medical devices, biomaterials and composite research, nanotechnology related to drug development and delivery, diagnostics, clinical imaging, and information technology related to human health.

Discovery and Utilization of Enzymes for Renewable Biofuels Production

POC: Dr. Pakrasi (Washington University)

- Projects focus on three areas:
  - improving the efficiency of transforming biological materials into energy
  - enhancing the reliability and cost effectiveness of biofuels
  - increasing the efficiency of transforming sunlight into energy via biological materials (plants and algae)
- Members of the Missouri Biofuel Research Consortium in St. Louis, a group of 20 world class plant scientists, are receiving funding from the Missouri Life Sciences Research Board for this project

Bioterrorism

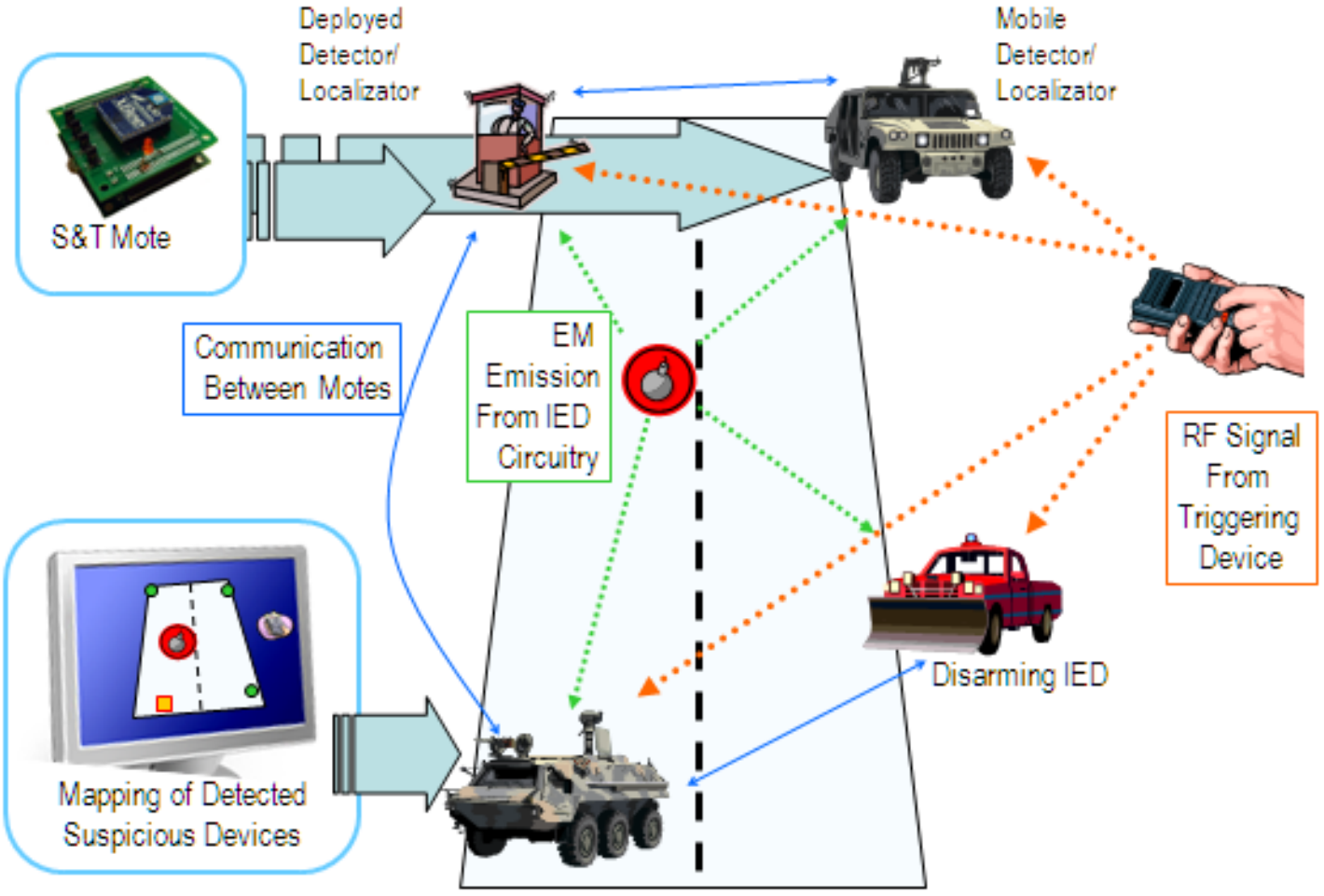
- Missouri's leading bioterrorism research institutions include:
  - St. Louis University School of Public Health Institute for Biosecurity
  - Missouri Department of Health and senior Services
  - (DHSS) Center for Emergency Response and Terrorism
  - Midwest Research Institute
  - Missouri TeleHealth Network
  - Missouri National Guard Civil Support Team
  - Fort Leonard Wood Immune Building at Nord Hall
  - Fort Leonard Wood Coast Guard Chem-Bio Training
  - Missouri University Regional Biocontainment Laboratory
  - Fort Leonard Wood CBRN Responders Training Facility
  - National Bio and Agro-Defense Facility

POC: Curt Davis (University of Missouri-Columbia)

- Satellite and airborne remote sensing
- Advanced geospatial data processing, automated feature extraction and target recognition
- Large dataset visualization, computer vision, intelligent databases, and information retrieval

IED Localization using Spatial Diversity of Wireless Sensor Networks

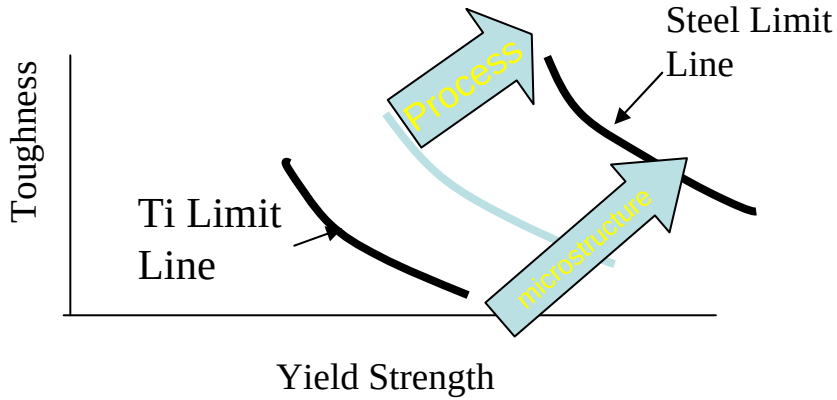
POC: Jag Sarangapani (Missouri S&T)



High Performance Alloy Materials and Advanced Manufacturing of Steel Castings for Improved Weapon System Reliability

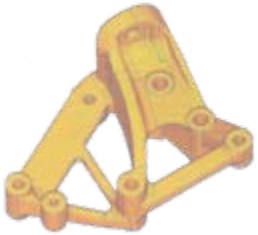
POC: Von Richards (Missouri S&T); Robert Dillon (U.S. Army Benet Labs)

Casting Alloy and Process Development: Improving Strength and Toughness



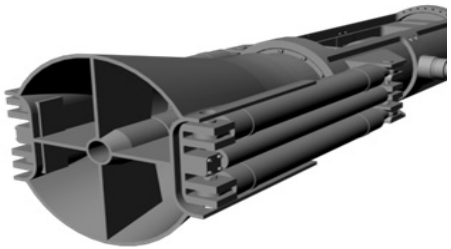
Casting saves weight by putting material only where it has function:

Original Design
Not Cast



New Cast Design
Lighter Weight

Example Benet Lab applications:



Partners:

MISSOURI S&T

SFSA

DEPARTMENT OF THE ARMY · UNITED STATES OF AMERICA · 1775

BENÉT LABS

Fiber Reinforced Polymer Systems

POC: Genda Chen (Missouri S&T)

- Missouri S&T has significant expertise in the use of FRP composites in new construction and in retrofitting and rehabilitation of existing structures.
- FRP composites have very high strength-to-weight ratios in addition to being resistant to corrosion.
- Three identical, one-quarter-scale replicas of typical bridge columns were designed, constructed and tested.
- Columns included a sensor to detect cracks.

Missouri S&T researchers prepare to detonate high explosives by their bridge column replicas. Tests were conducted at Fort Leonard Wood.

Questions?