Regional Strategies

non-traditional, cluster-based grant programs

Education/Training Programs at UTA for Autonomous Unmanned Systems (AUS)

Aerospace and Defense Cluster

Dallas/Forth Worth and North Texas Region

Meeting Industries' Critical Workforce Needs

Education/Training Programs for Autonomous Unmanned Systems

Executive Summary

- Recommendations of the Aerospace and Defense Cluster Assessment report (ADCAR)
  - prepare the Texas workforce for challenges by *"rapidly advancing technology and specialized skill requirements"*.
  - Fulfill the *"just-in-time"* Texas workforce needs at the pace of technological growth
  - *"Market and promote the benefits of building a career in aviation, space and defense"*
  - *"Broaden the availability of post-graduate engineering and design programs that complement the skill requirements of this industry."*
- *"Texas needs to address building a talented workforce pipeline; Texas' education system is responsible for developing the future workforce; and applied learning skills must be incorporated into the curriculum."*
- *"Homeland security", "autonomous robotic vehicles" and "UAV (Unmanned Aerial Vehicles)" among "the technologies that could create profitable business opportunities."*
  - Worldwide UAV expenditures will increase to $8.3B per year in 2015 from the current level of $2.7B per year.
  - These annual expenditures add up to $54.5B market value over the next decade
  - 35% of the expenditures will be for research and development.
- AUVS needs sensors, actuators, communications and more importantly decision-making capabilities in a multi-disciplinary environment
- Development of Education and training laboratory in the emerging area of Autonomous Unmanned Vehicle Systems (AUVS)
  - create learning materials and teaching strategies
  - develop faculty expertise
  - implement educational innovations: a multi-disciplinary course/workshops sequence/curriculum and associated infrastructure
  - **unified-engineering** approach by introducing various engineering disciplines in a harmonized, unified format so that the multi-disciplinary nature of autonomous vehicle system development can be clearly illustrated

Education/Training Programs for Autonomous Unmanned Systems

Regional Partners and Stakeholders

- The project will be conducted at College of Engineering of University of Texas at Arlington (UTA) by faculty of the Autonomous Vehicles Laboratory (AVL)
  - Dr. Atilla Dogan, Mechanical & Aerospace
  - Dr. Kamesh Subbarao, Mechanical & Aerospace
  - Dr. Arthur Reyes, Computer Science & Engineering
  - Dr. Brian Huff, Industrial & Manufacturing Systems
- Industry advisory group includes
  - Charles Shepard, *Bell Helicopter XworX*
  - Larry Stephens, *Systems Engineering, Lockheed Martin Missiles and Fire Control*
  - Dave Duggan, *Geneva Aerospace*
  - Randy Dumse, *New Micros, Inc.*
  - Regional leadership and planning agencies
- Target impact group(s), examples include
  - Incumbent or dislocated workers
  - Youth entering the pipeline

Education/Training Programs for Autonomous Unmanned Systems

Cluster Impact Strategies & Deliverables

- **Senior Design Curriculum**: interdepartmental, two-semester, team project to develop autonomous vehicle systems & enter them into international student competitions
- **Graduate Specialization Curriculum**: A collection of extant graduate courses, & a couple of new courses providing students with essential knowledge & skills
- **Summer Professional Workshop**: One-week, intensive, hands-on experience
- **Summer High School Workshop**: One-week, hands-on experience
- **Testing & Training Facility**
- **Graduate Certificate Feasibility Study**
- A four-hour learning & experience module for two existing summer High School programs
- Cluster Impact
- Inclusion of Summer Professional Workshop into the WECM

Sustainability:

- UTA provides laboratory and classroom space
- AVL faculty will voluntarily run the programs
- A volunteer-based student team
- A corporate sponsorship base
- Tuition for professional workshops
- Seek support for our program at federal level
  - NSF (*National Science Foundation*)
  - DoD (*Department of Defense*)

Education/Training Programs for Autonomous Unmanned Systems

Key Issues and Challenges

- Coordinate a multidisciplinary course among various departments Equip students with more than what traditional college and university curricula provide
- Teach integrated relationship of disciplines across the curriculum is a challenge for engineering education
- Promote Autonomous Unmanned Vehicle Systems as carrier choice among undecided pool of professionals and young high school students
- Ensure that students attain skill levels recognized by employers
- Develop communication and program between industry, education, and government to address the short-and long-term workforce needs
- Reach out and inform people statewide about our project
- Reach out to underrepresented institutions within the North Texas area
- Market the availability of the course offering to potential students
- Reach out to local industry for support of their employees to attend summer professional workshop
- Develop testing and training facility up to the industry standards
- Make testing and training facility available for local use

Education/Training Programs for Autonomous Unmanned Systems

Primary Contacts

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