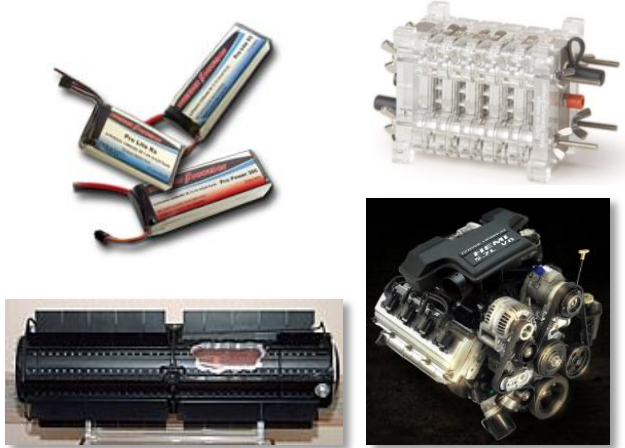




Workforce Development in UnManned Systems (UMS)

Craig A. Woolsey, Professor
Aerospace & Ocean Engineering
Virginia Tech

What's a "UMS"?



Power



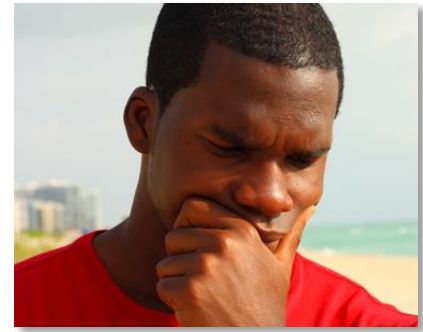
Mobility



Communication/
Interface



Perception

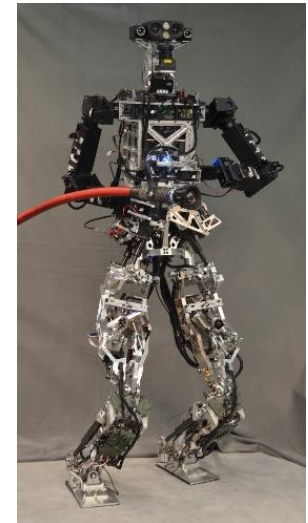


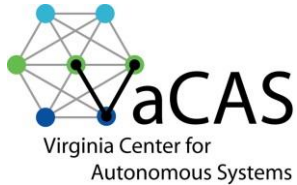
Cognition



Education

- Engineering
 - ~200PhD, 400M, 1700B/Yr
 - 14U & 17G programs
 - 6th(U) and 12th(G) public
- Agriculture & Life Sciences
 - 13 degree programs
 - 11 ARECs, 107 Ext. Offices
- Architecture & Urban Studies
 - School of Public & International Affairs
 - Center for Public Administration & Policy





Research

- Guidance & Control
- Sensing & Navigation
- Mobility & Actuation
- Modeling, Analysis, & Design
- Safety & (Cyber)Security
- Power Electronics
- Wireless Communication
- Human/Computer Interaction
- Discovery Analytics
- SocioTechnical Systems
- Transportation





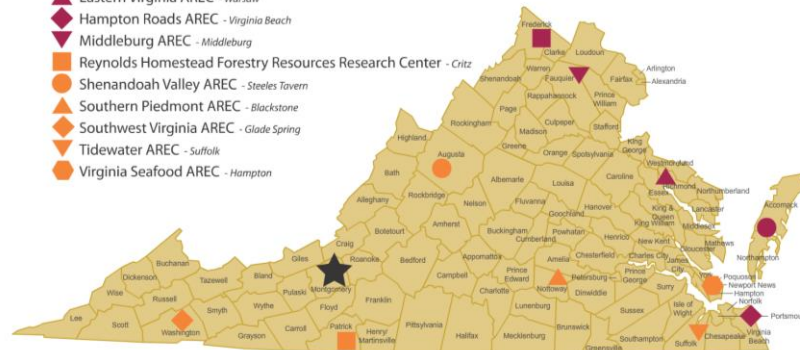
Outreach

- Agricultural Extension
- STEM Education
- Industry Affiliations
 - Center for UAS
 - MAAP (UAS Test Site)



Agricultural Research and Extension Centers

- ★ Virginia Agricultural Experiment Station - Blacksburg
- Alton H. Smith, Jr. AREC - Winchester
- Eastern Shore AREC - Painter
- ◆ Eastern Virginia AREC - Warsaw
- ◆ Hampton Roads AREC - Virginia Beach
- ▼ Middleburg AREC - Middleburg
- Reynolds Homestead Forestry Resources Research Center - Critz
- Shenandoah Valley AREC - Steeles Tavern
- ▲ Southern Piedmont AREC - Blackstone
- ▲ Southwest Virginia AREC - Glade Spring
- ▼ Tidewater AREC - Suffolk
- Virginia Seafood AREC - Hampton



Workforce Supply & Demand (Engineering)



Overall supply and demand

- Applications and placement rates are high.
 - 75% undergraduate acceptance rate.
 - 1700 bachelors, 400 masters, 200 doctorates annually.
- Admissions will increase up to 20% by ~2020.

An issue: Diversity

- Undergraduate (US Students): >70% white, >75% male
- Graduate (US Students): >75% white, >75% male
- Center for the Enhancement of Engineering Diversity (CEED) Programs:



C-TECH²



Imagination

How can we do better?



- Educators have two customers:
 - The students
 - Their employers
- Both are attracted to **opportunities** and **excellence**.
- Create **opportunities to excel**:
 - **Pull**: Self-driving cars on the Parkway? UAS bridge inspections?
 - **Push**: Summer research/internships? An annual student technology symposium?
 - **Stretch**: Clever 2-3 dual degree programs? Streamlined process for online transfer credit?