

UAS Team and UAV Team

February 3, 2017

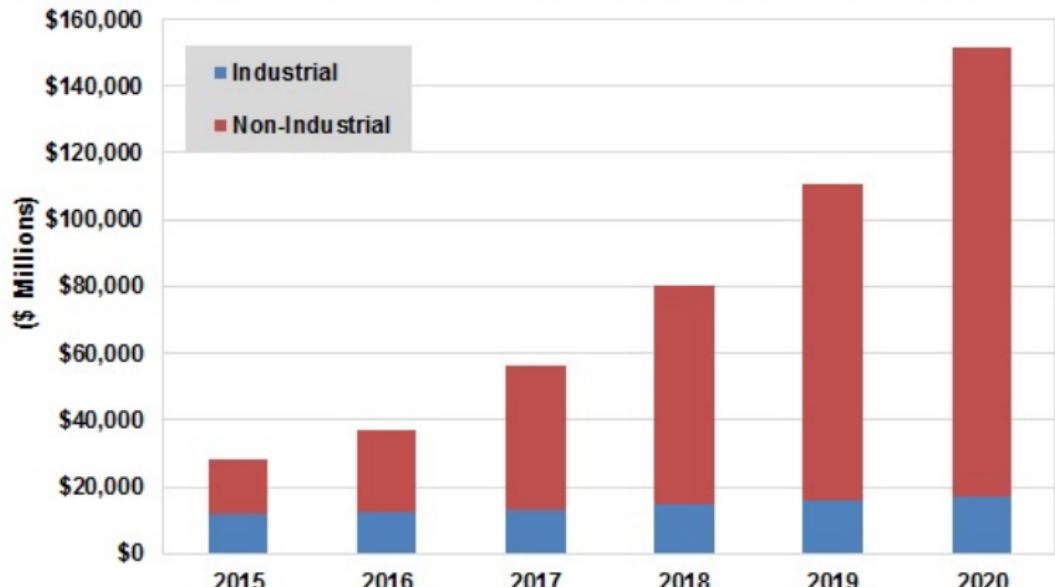
The Future is Robotic

- ▶ The future is increasingly being automated and made robotic.

The Future is Robotic



Total Industrial and Non-Industrial Robotics Revenue, World Markets: 2015-2020



Source: Tractica

Figure 1: World Market for Robotics and Automation

The Future is Robotic

- ▶ Tractica is estimating about a \$146 Billion world market for automation and robotics in 2020.
- ▶ Other estimates have been around \$135 Billion.
- ▶ Which is a UPWARD adjustment from estimates in 2010 that predicted \$110 Billion world market for automation and robotics.

The Future is at SDSM&T

- ▶ The university has adjusted to advancing technologies with programs such as the Computational Sciences and Robotics Masters program, and classes such as ME 781 Robotics, CENG 452 Robotic Control Systems, CSC 415 Introduction to Robotics, and many more.
- ▶ Student competition teams such as the Robotics Team, Unmanned Aerial Vehicle Team, and Unmanned Aircraft Systems Teams.
- ▶ Research projects hosted at the controls labs, computer vision labs, and intelligent flight systems labs.

The Future is at SDSM&T



Figure 2

UAS Teams and UAV Teams

- ▶ Although the names are similar, the goals, outcomes, team composition, and resources are very different.

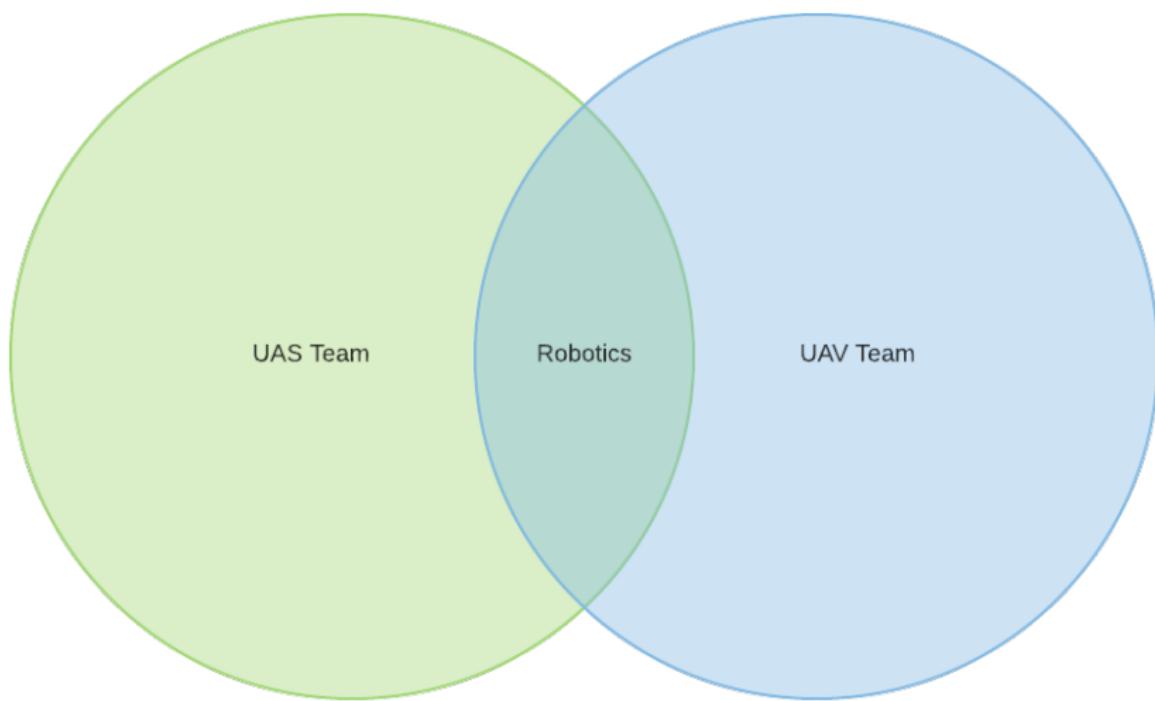


Figure 3

Different Goals (UAS Team)

- ▶ UAS Team is creating a competition open to universities and high schools interested in aerial robotics.
- ▶ The end product will be a new competition, to be hosted by SDSM&T.
- ▶ The challenges are in organizing and supporting groups both within and outside the university to participate.

Different Goals (UAV Team)

- ▶ UAV Team is participating in the Association for Unmanned Vehicle Systems International (AUVSI) International Aerial Robotics Competition (IARC).
- ▶ The purpose of IARC is the challenge students to accomplish something never done before. There's a fair bit of research required to participate in the competition in any meaningful way.
- ▶ The end product will be successful competition at the IARC, as well as any research that may have been performed in accomplishing this task.

Different Outcomes (UAS Team)

- ▶ The competition created and hosted by UAS Team will increase SDSM&T's exposure to High School students and undergraduate students at other universities.
- ▶ This has the potential to raise the prestige of the university to a younger audience and attract the kind of future students who can keep these programs successful.

Different Outcomes (UAV Team)

- ▶ The IARC competition brings together high performing, mainly research oriented teams.
- ▶ The teams, particularly from MIT, Georgia Tech, and Virginia Tech, typically are composed of PhD students, PhD researchers, post-doctoral researchers and industry partners.



Different Outcomes (UAV Team)

- ▶ Successful participation in this competition has the potential to raise the prestige of the university, but is unlikely to attract new students.
- ▶ An expectation are that grad students will be able to generate thesis-worthy projects and research from this competition.

Different Team Compositions

- ▶ UAS Team has members of all educational levels and provides opportunities for all students to participate.
- ▶ UAV Team is accepting of members of all educational levels, however the difficulty of the work often may be exclusionary for less educated or experienced members to contribute effectively.
- ▶ There are distinct personality differences between the teams, and each team brings together people with different motivations.

Different Resources

Resource	UAS Team	UAV Team
Lab	MC 113	Foundation Bldg
Finances	NASA, SOAP	Research Grant
Team Composition	Undergrad	Thesis-Oriented Graduate

Prior Precedent with Other Student Organizations

- ▶ Formula SAE and Baja SAE

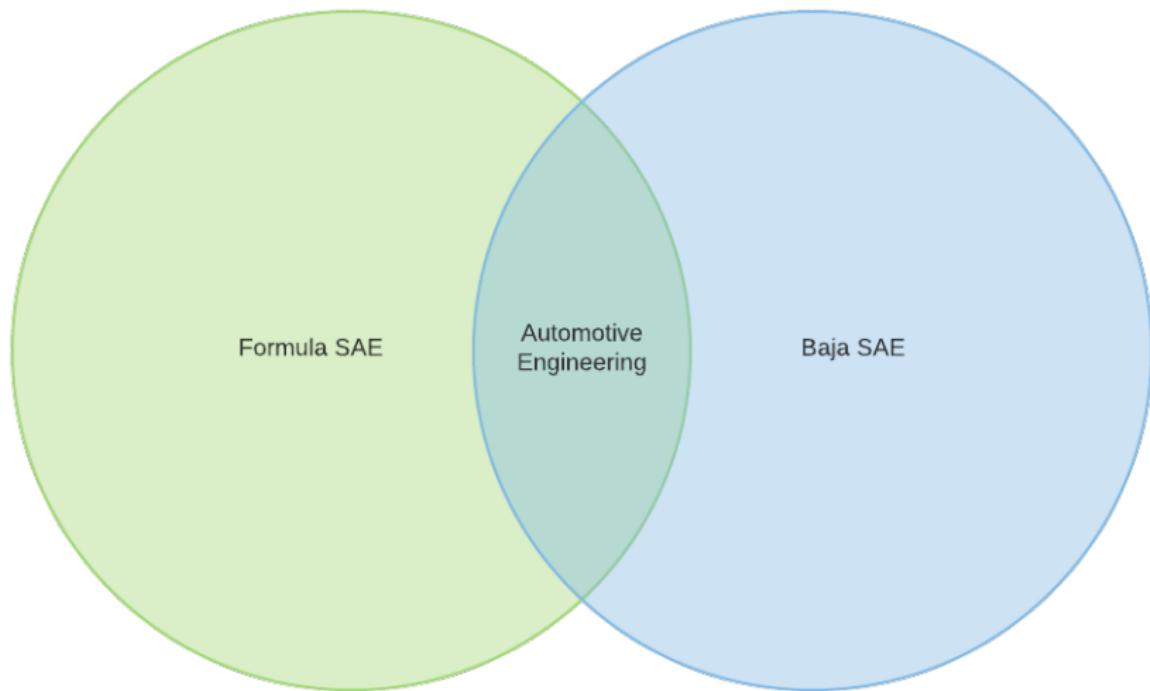


Figure 4

Prior Precedent with Other Student Organizations



Conclusion

- ▶ The teams have different goals and outcomes.
- ▶ Each team provides different opportunities to improve and advertise the SDSM&T image that isn't possible alone.
- ▶ Eliminating one team or merging the teams will leave some students without a way to apply their motivations towards a constructive goal.

Conclusion

- ▶ It's easy to destroy, hard to create, and almost impossible to inspire.
- ▶ What we want is to maintain two recognized student organizations, which inspire to create within the different groups.