FIRST Robotics

Deep Run 1086 Blue Cheese

FIRST Robotics

- For Inspiration and Recognition of Science and Technology

- Nonprofit global robotics league where young, innovative, and creative minds explore science and technology, solve realworld problems, and compete in exciting, hands-on robotics challenges.

- 4 levels of Competition from Kindergarten through 12th grade; Jr.FLL, FLL, FTC, FRC

- Teaches valuable skills; Engineering, Programming, Electrical, Leadership, Teamwork, Communication, Problem Solving

- Alumni are often workforce-ready right out of high school

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Our Team – Blue Cheese

Founded in 2002, around 60 students, 29% minorities, 37% females

Our team competes in the top 2 levels of FIRST robotics, FTC and FRC.

FTC	FRC
Rookie team members Spans Fall & Winter 18"x18" robot Programmed in Java	Spans Winter & Spring 120 pound robot designed & built in 6 weeks Programmed in C++

Each robot must be programmed to operate within the security constraints of the field, autonomously as well as driver operated.

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Our Team – Blue Cheese

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Our Successes

Over the past 13 years we have made it to the world championship 9 times. We have received awards at both the regional and championship levels.

Best accomplishments are off the field
- Robotics program at James River Juvenile Detention Center
  - Donated robots and field kit
  - Worked with teacher on how to teach programming
  - Send robots to center every August for kids to work with a full day
- Richmond Public Library
- Richmond Area Program for Minorities in Engineering
- Hackathon for kids

Alumni - Biggest Area of Success

John Kutz (2010)
- Mechanical Engineering graduate VA Tech
- Employed with CERDEC at Fort Belvoir

Kathryn Hutchins-Duda (2014)
- Computer Engineering major at VCU
- Does research work in the field of Unmanned Aerial Vehicles

Matthew Petrie (2011)
- hired after high school graduation by our sponsor
- Mechanical Engineering major at VCU.

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Alumni

Kathryn Hutchins Duda, '18
Electrical & Computer Engineering
UAV Lab
VCU
School of Engineering

VirginiaTech
Invent the Future

Vehicle Design Com

2015 Additive Manufacturing
Vehicle Design Competition

VT-ARC
Virginia Tech
Applied Research Corporation

Mecha onics Lab

2015 Additive Manufac
Vehicle Design Comp

Stiefel Fa
Foundation

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FIRST & Blue Cheese Statistics

FIRST robotics programs have affected over 400,000 kids worldwide this year alone.
    94% graduate high school
    87% alumni study or work in STEM related fields
    41% major in engineering
    33% of women major in engineering

Our Team:
    100% high school graduation rate
    94% alumni work in STEM related fields or areas of study in college

Challenges

Funding
- Not in school budgets
- Self funded

Coaches
- Significant time commitment, teachers not given incentives

School constraints
- No build site at school
  - Rely on businesses
- No access to machinery
  - Some school districts do not let the teams use machinery at all

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Challenges

These challenges are not unique to us, and are a barriers that prevent most students from having the opportunity to join a team and learn critical STEM and soft skills. We are lucky to be in an area that has the connections for our team to be able to succeed.

VA has 339 high schools, but only 162 FTC and FRC robotics teams, with just under half being FRC, and that includes non school-based teams.

VA has 1513 Elementary & Middle schools, and less than 30% of them have FLL or FTC robotics teams.

The earlier students are engaged in STEM programs, the more likely they are to continue into STEM fields.

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The Problem

VA is not producing enough STEM workers to satisfy current needs much less to allow for growth of STEM based industry

- 45% of VA's labor market is STEM related
- 3,268 students graduated in IT in 2013-2014
- 29,000 unfilled IT jobs in VA
- Expected to rise to 70,000 unfilled jobs
- Ranked 11th in US for H-1B Visas and the numbers increase yearly from 11,392 in 2012 to 13,113 in 2013 compared to Michigan which is 14th
- Ranked 48th in GDP in 2014 compared to Michigan which is ranked 20th

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MI, the Leader in Robotics and Cyber Initiatives

When considering what to do we should look to a recognized leader, Michigan

- 2011 - Michigan Cyber Initiative
- 4th year of their North American International Cyber Summit which sold out the first 3 years
- 2013 - Michigan FIRST Grant Program under Department of Education
- 2015 - For the 2nd consecutive year created more FIRST Robotics teams than all of the other 49 states combined and is now home to more teams than any other state
- 2017 to 2021 Detroit will begin hosting the annual week long FIRST World Championship with an estimated $19 million yearly economic impact
- Michigan is third in the country in the robotics industry with nearly 58,000 robotics jobs

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What You Can Do

VA needs to allocate resources to education in order to engage students earlier and increase the number of graduating seniors heading into STEM based fields including CyberSecurity.

- Grant Program
  - Public & Private funding sources
  - Underserved schools
  - Allow more schools to provide access for students to STEM based competition programs like FIRST Robotics, CyberPatriot, and STEM based out of school activities and lab equipment.
- Formal support structure in school systems
  - Incentives for teachers to coach STEM based competition teams - stipends or CEUs
  - Access to labs and machinery

Robotics is a sport where every student can go pro!

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Sources

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