



THE
GREENHORNS

ROBOT IN THREE DAYS

AND HOW TO USE IT



Hello!

My name is Ryan Swanson

Sophomore at NDSU in Mechanical Engineering

Co-founder of Bison Robotics

Service Coordinator and Ri3D Project Lead

Alumnus of FRC 4607 CIS

WHAT IS ROBOT IN THREE DAYS? (Ri3D)

- **2013** - started by a Florida company, IR3 Creative
- **2014** - super mentors like JVN, Joe Johnson, and Aren Hill participated

Teams included: Team ORYON, Boom. Done., and Ri3D 1.0

- **2015** - U of M and NDSU got involved
 - **U of M** - GOFIRST - Snow Problem
 - **NDSU** - Bison Robotics - The GreenHorns



ABOUT BISON ROBOTICS: THE BASICS

What is it?

College robotics club that does competition and service projects

For how long?

Established November 2014 by Kacy McCormick and Ryan Swanson

Members?

2014: *24 members*
2015: *100 members*

ABOUT BISON ROBOTICS: WHAT WE DO

Competitions:

- ◆ NASA Robotic Mining
- ◆ Autonomous Snowplow
- ◆ Design. Build. Fly. Quadcopter/Drone
- ◆ Battlebots

Service:

- ◆ FRC Volunteering (35 members)
- ◆ MN FRC Regionals
- ◆ Two FLL Teams
- ◆ Best Robotics Competitions

WHAT IS RI3D

Robot in 3 Days

Build an FRC Robot in 72 hours.

Use FRC Principles

Our experience in FRC give

High Pressure

Starts right at kickoff!!!

ABOUT THE GreenHorns

- Def: (n.) one who is inexperienced or new to an experience
- Joined the party late: decided to participate with only 1 month to prepare
- Only had 12 members in 2015
- Worked on very little sleep
- Only one member knew any programming going into it

R13D Preparation

- Things to figure out:
 - Where to go, how to get funding, how to live stream, how to tackle the challenge
- FRC CIS 4607 and FRC 3276 The Toolcats helped cover almost everything
- **Reason for rushing into it:** wanted to push the club to its limits (*first event for us*)

RI3D Preparation cont.

- Ri3D Gantt Chart - laid out every hour
- Broke six-week build season into 72-hours
 - One hr of FRC time = four min. Ri3D
 - One day of FRC time = 96 min. of Ri3D
 - One week of FRC time = 11 hrs, 12 min. of Ri3D
- Broke into specialized teams to accomplish tasks better
 - Programming, electrical, mechanical etc.



RESULTS OF R13D

- Successful first year in 2015 - 2016
expectations are higher
- Videos were not as polished as could
have been - Reveal Video
- Posted videos w/ ~5,000 views!
- ~20 videos in total

GreenHorn v1 Performance



Drive

Integrated slide drive onto Kit of Parts drivetrain



Tote Flipper

Made it so it could flip over totes



Stacks

Stacks of six in parts (could do in two minutes with minimal driver practice)



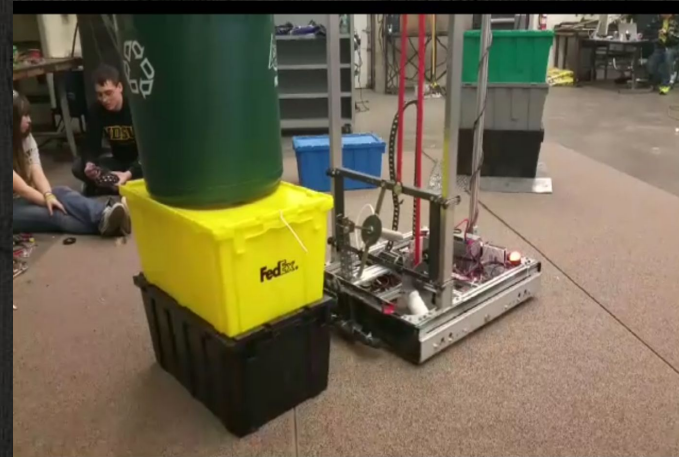
Containers

Could drive up to the step to grab recycling containers



Capping

Could cap a stack of four totes



IMPACT OF RI3D

- Rookie teams used our robot at offseason events
- Were able to answer questions from FRC teams throughout build season
 - Integrating slide drive
 - Claw mechanism
- UND is now starting a Ri3D team!





And now...

RI3D 2016



RI3D 2016

- Have \$3,000 from NDSU for Ri3D
- CIS has opened its shop and school to us again
- Bison Robotics has separate \$500 for streaming equipment
- Limit of 20 team members



RI3D 2016 CONT.

- Hope to have Ri3D display at the MN Regionals
- Plan to meet up with Snow Problem - actual robot vs. robot gameplay
- Plan to actually build field elements - more realistic

HOW TO STAY UPDATED:

Twitter: @greenhornsri3d

Facebook: The GreenHorns

YouTube: The GreenHorns Robotics



FRC Takeaways

Gantt Chart:
Plan in detail

Drive Practice:
Improve

Time Restrictions:
Work efficiently



Thanks! **Any**
QUESTIONS?

Feel free to contact me at
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