

Coaches' Workshop

Time and Team Management

September 16, 2017

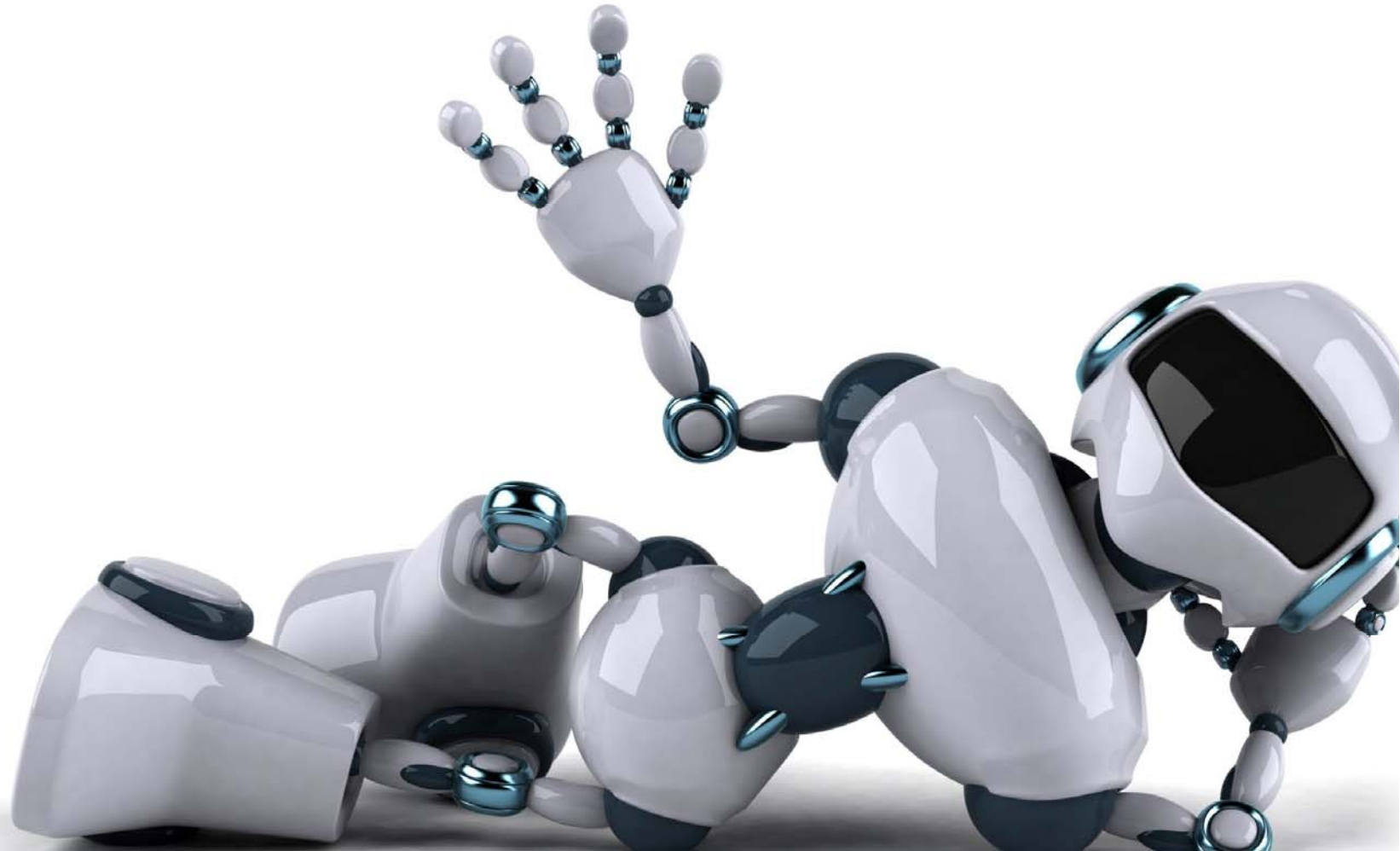
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Topics

- Team organization
- Team meetings
- Balanced priorities
- Learning fast
- Failing fast and often
- Other tips and tricks



Organizing a Team

- After 2-3 meetings, define jobs, and have the team decide who will do what.

- (1-2) Programmers

- (1-2) Builders

- (1-2) Project Leaders

- (1-2) Table Manager / Driver

- (1) Coordinator

- For younger teams, it's really helpful to have 2+ mentors at meetings to guide different groups as they work.
- Everyone can participate and have a voice in each job, but when it's time to divide and conquer, the kids know what to do.
- Send groups of kids to different areas



Note: It's important to set expectations with parents that each kid will have an important job, but that the jobs are not all robot-centric.

Team Meetings

- Define how meetings should run.
 - Start and end on time.
 - Make sure the kids are fed / hydrated when they show up.
 - Start and end each meeting with 10 minutes of group time, then divide up by jobs
 - Review progress and plan next sessions in advance so kids come ready to go.
 - Schedule a 5-10 minute “run around” break half way through the meeting.
 - Make sure time is carved out for having fun together as a team - helps them work when it's time



Balance Priorities

- Research Project:

Do: Pick a research project EARLY. It may change as you go along! Start off investing time in research about the problem. Talk to an expert before developing a solution.

Don't: Pick a problem solution that the kids can't learn to do themselves

- Core Values:

Do: Talk together at the beginning and end of each meeting about what happened. Encourage the team to figure out how to make decisions and to settle disagreements.

Don't: Don't ignore this component!! It is IMPORTANT and leads to better robots and research projects. Gracious Professionalism is the heart and soul of FIRST.

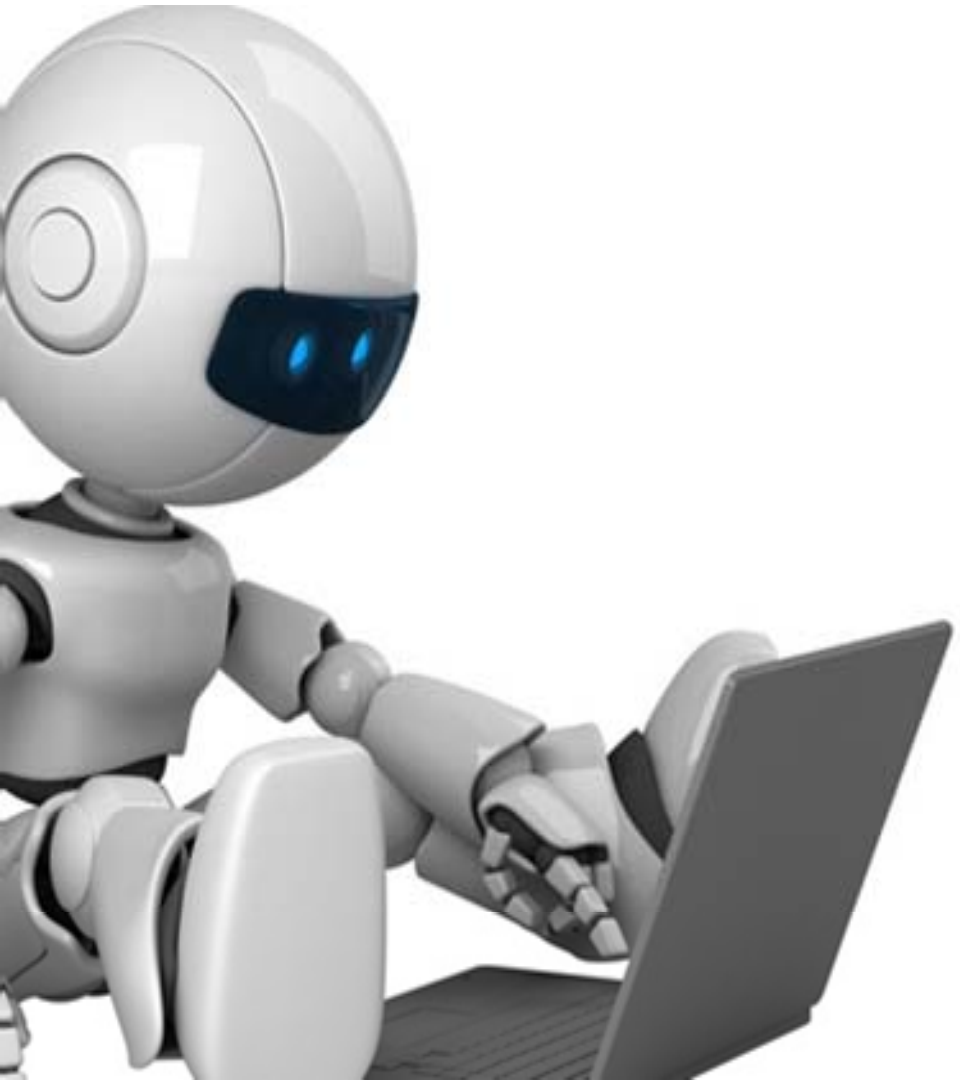
- Robot Game:

Do: If the team is new, drive the team to SIMPLIFY their robot.

Don't : Make this the sole center of your attention as a coach.



Learning Fast

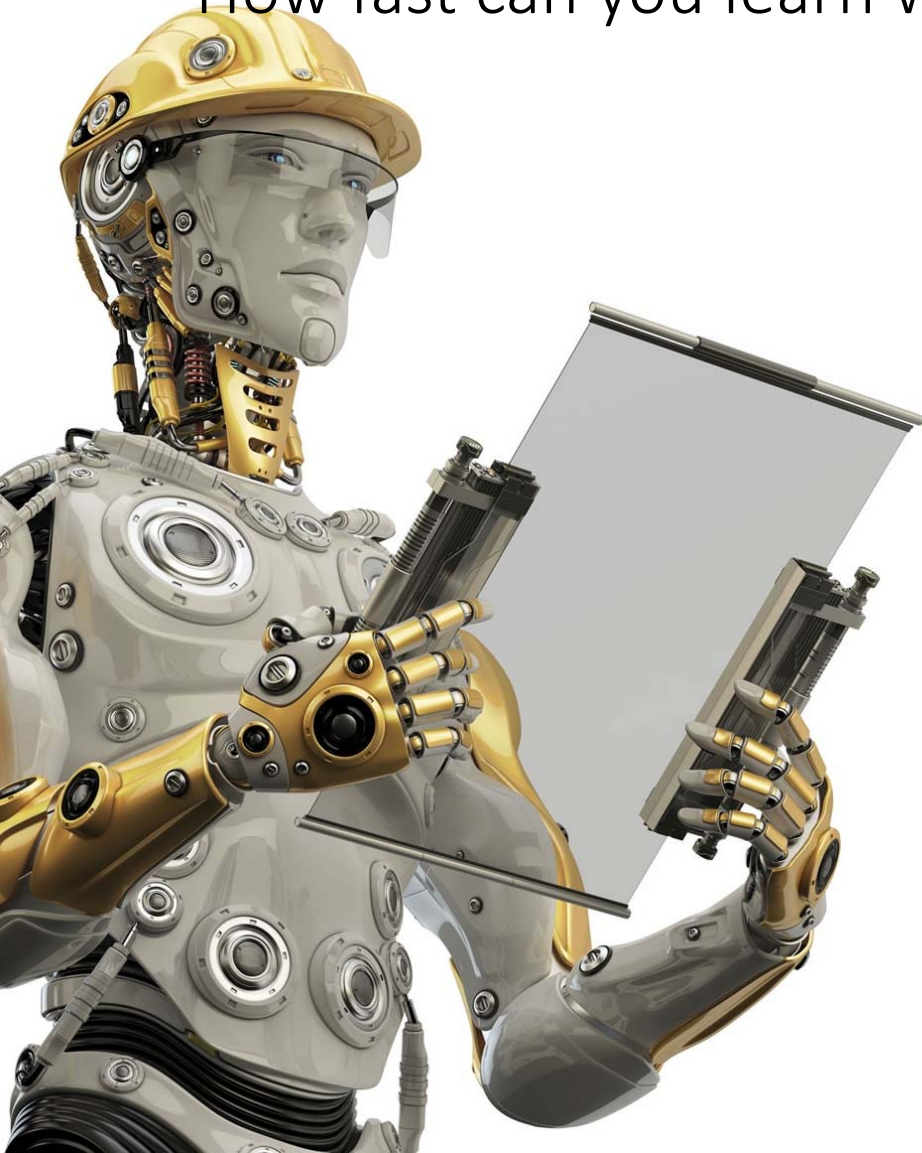


- Learn the project and game rules well, and make sure the kids know them.
Having to go back and redesign the robot or run is very frustrating.
- Go online early & often
Become YouTube ninjas (eg, watch BuilderDude 35's series)
- Use the community!
Find several other teams to partner with, and set up meetings between the kids and between the mentors frequently.
- Use the Facebook coaches' forum
Ask questions of other coaches.



Failing Fast and Often

How fast can you learn what not to do?



Iterate!!

The key to maximizing the team's robot game performance is ITERATION.

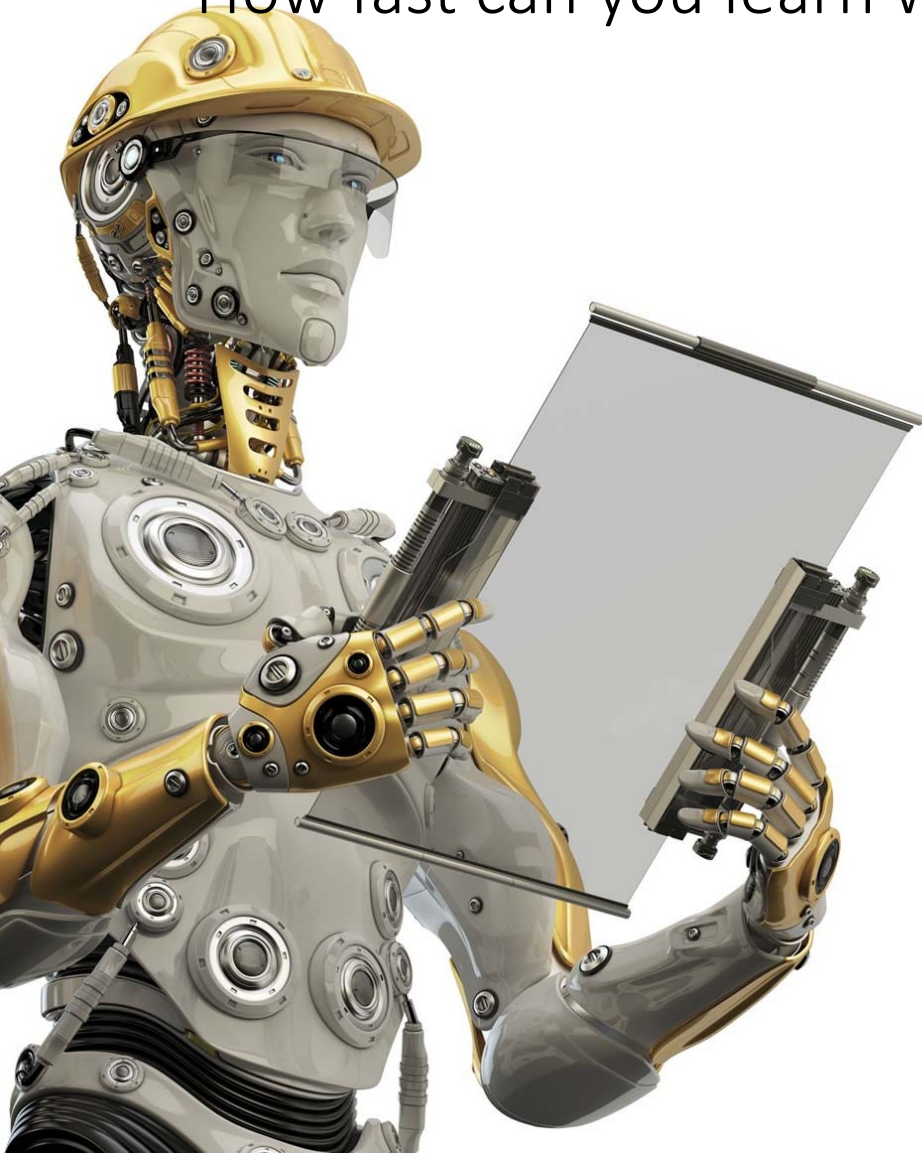
See how many times your team can run the robot during a 15-30 minute period.

Ask one of the team members to count!

Challenge the team to find ways to work quickly & to iterate more

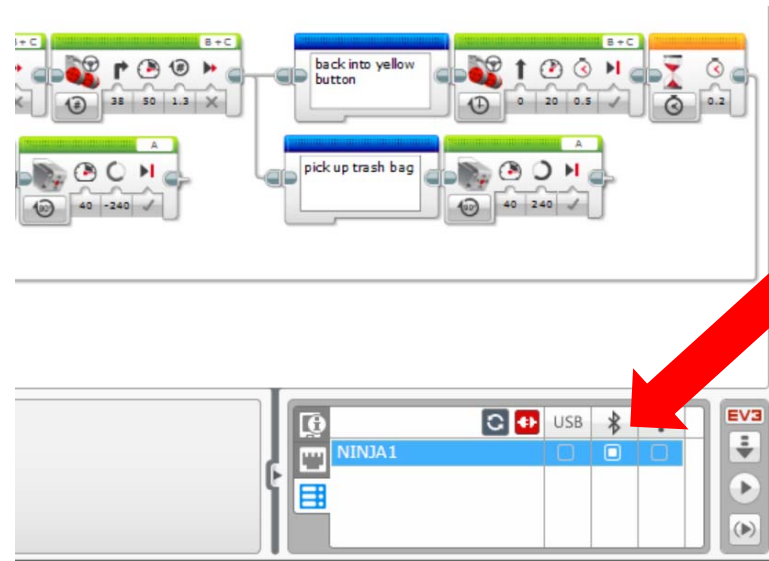
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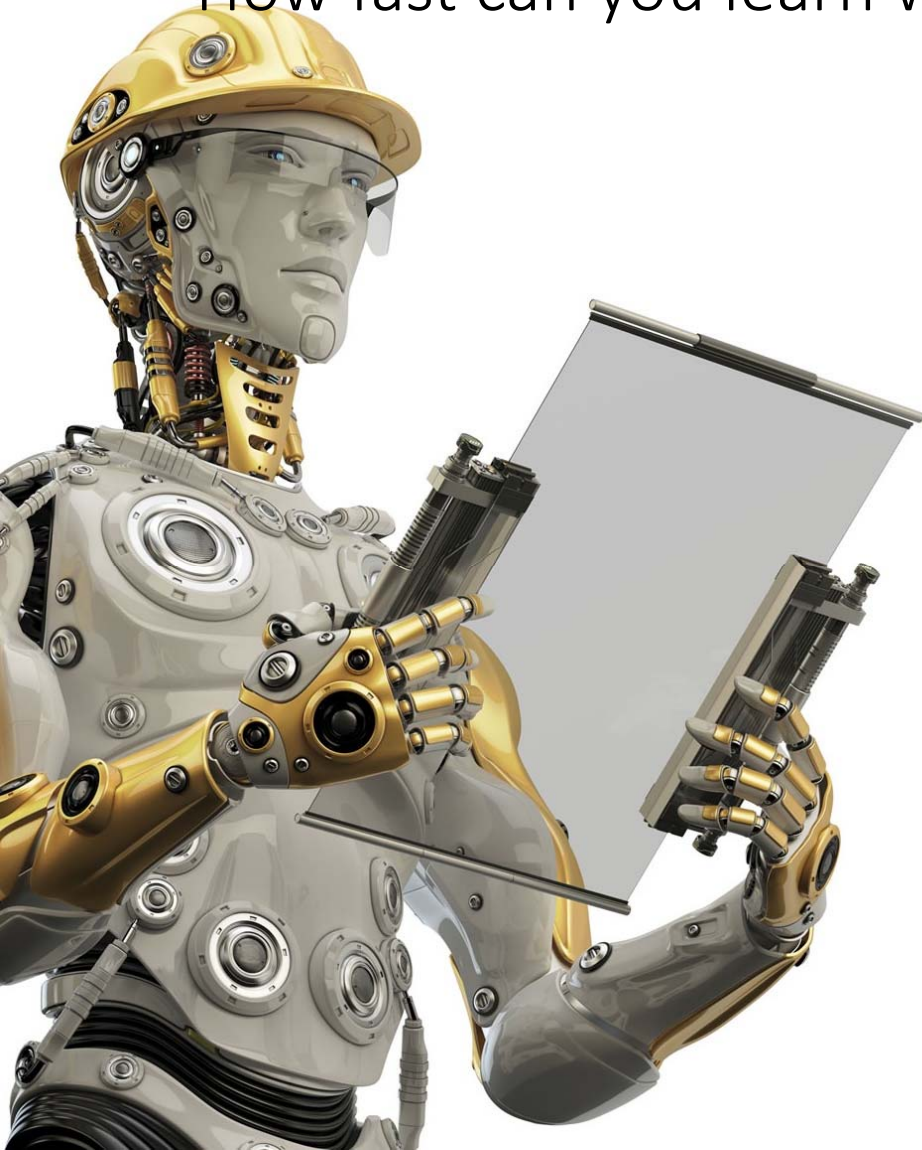
Use Bluetooth

Take the robot off the table as little as possible.



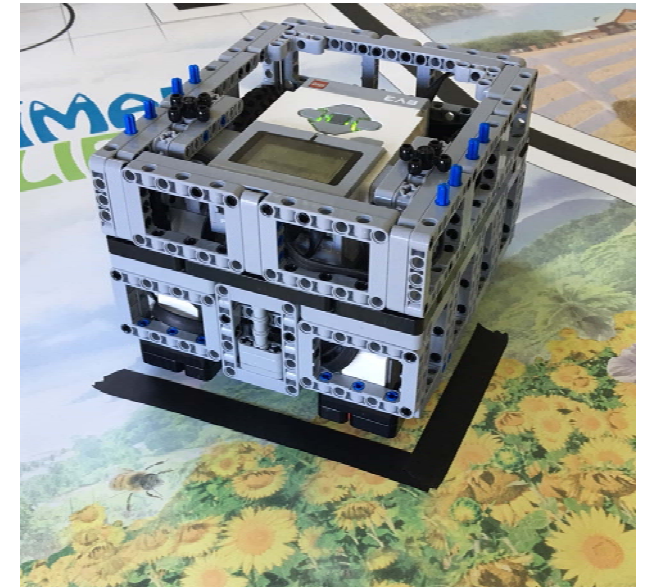
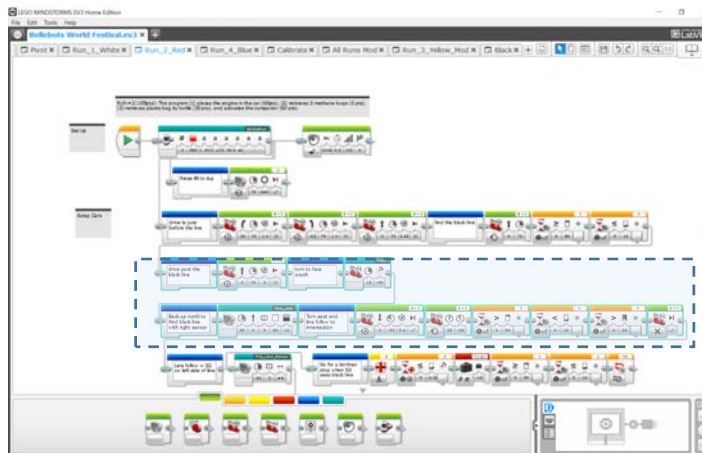
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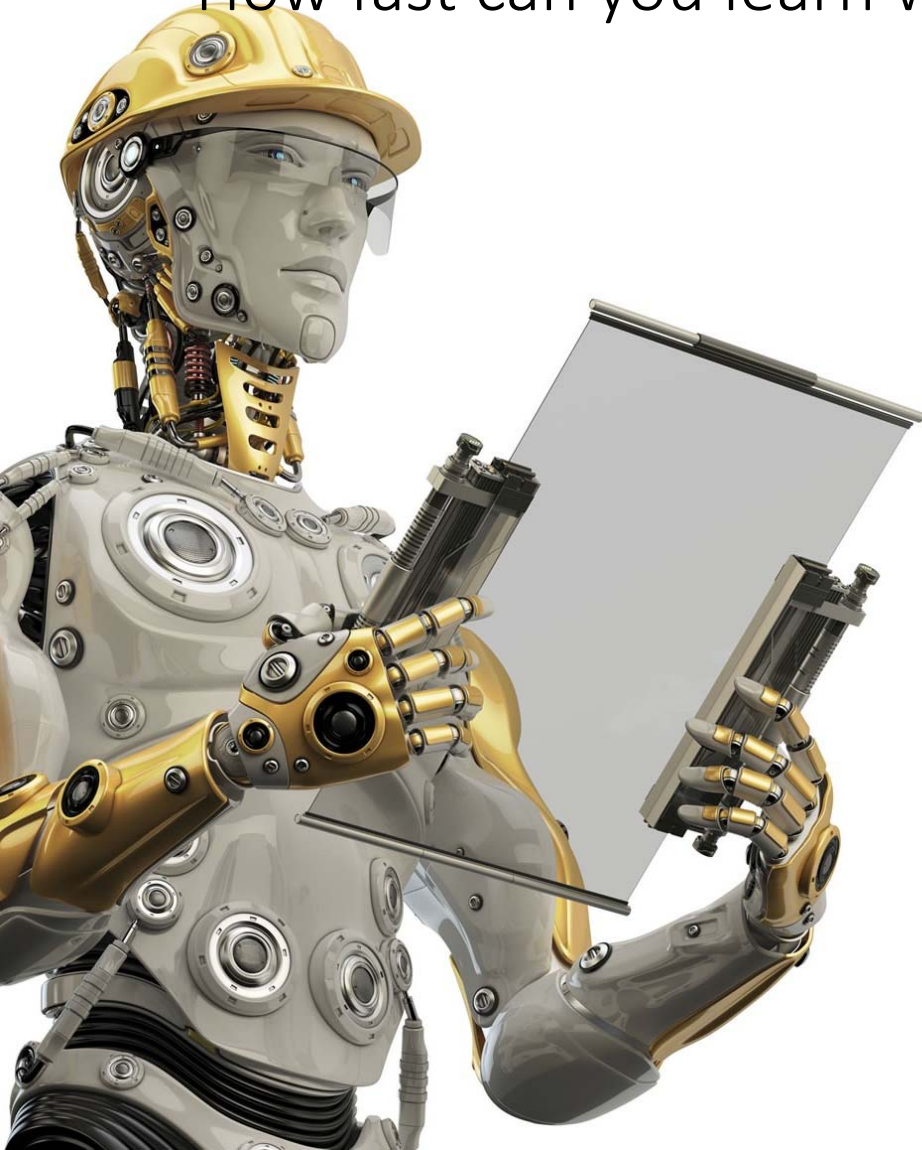
Run program segments

Use electrical tape to set mid-run starting points.



Failing Fast and Often

How fast can you learn what not to do?



Kids work in teams at the table

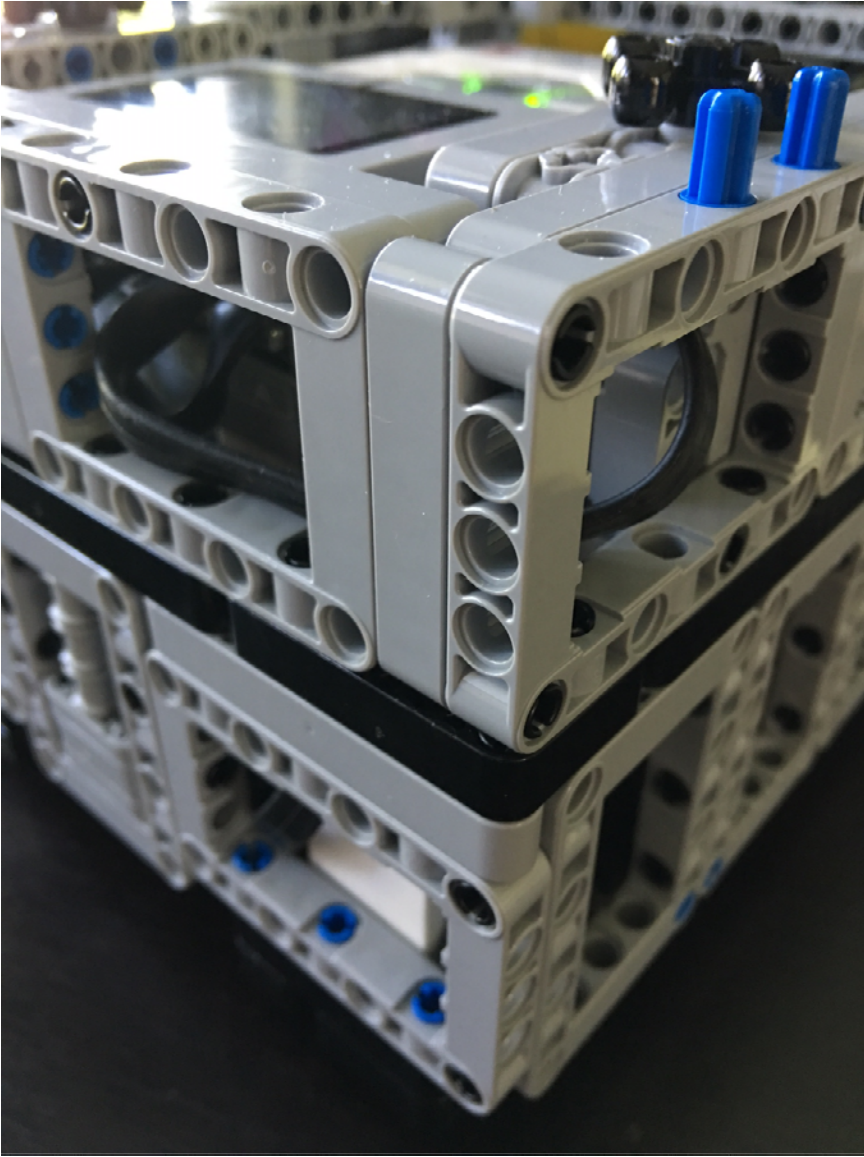
One sits at the computer and changes code

One handles the robot

One resets the table

Last two observe if the robot did as intended
and suggest corrections

Veteran Tips and Tricks that Save Time



Make a robust robot

Fragile robots won't operate the same way each time.

Push and pull on the robot to make sure it's tough.

Upfront attention to this will save many hours of troubleshooting later in the season.



Veteran Tips and Tricks that Save Time

Plan!!

Plan before building.

Eg, map the game: points, similar tools that can do multiple missions, how to navigate

Planning won't just help you design with purpose, but it will help when the judges see structured thought!



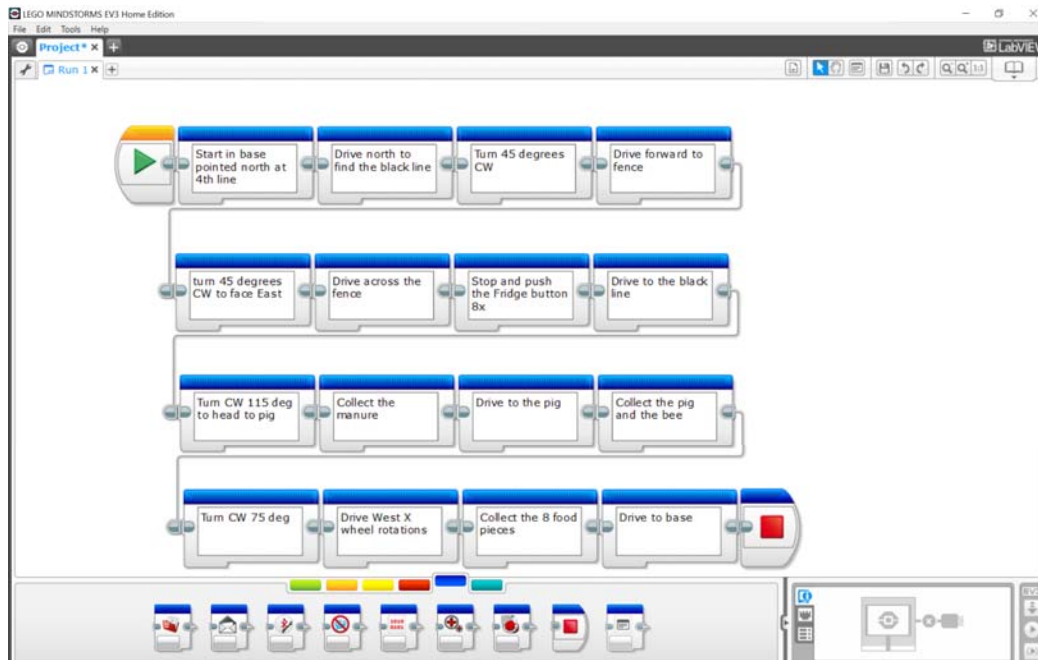
Veteran Tips and Tricks that Save Time

Plan!!

Plan before coding.

Describe the robot's actions in words and by moving the robot by hand before trying to program.

Code in blue comment blocks first, then insert code blocks between them



Veteran Tips and Tricks that Save Time

Orienteering!

Challenge the team to know (X, Y, α) as often as possible.

Find and use anchor points

Understand how much error they're likely to have in each, and think about what it means to repeatability.

The game is about getting to the right place with the right tool



Veteran Tips and Tricks that Save Time

Organize your Legos!

Hunting for each piece you need wastes time.

Seeing all the potential pieces enables more creative building.

Harbor Freight sells sorting boxes for <\$10 each. (They fit great into Ikea shelves too)



Veteran Tips and Tricks that Save Time

Develop skills before writing code for robot runs.

- Travel a measured distance
- Use sensors to detect conditions or events
- Turn 90 degrees
- Find a line
- Square to a line
- Square to a wall
- Follow a line

Teach the kids to know what kinds of moves they can make, then let them work through their library of choices as they design their robot game runs.



Veteran Tips and Tricks that Save Time

Try hard to avoid fixing problems through hardware (robot) design changes when software changes might work just as well.

Each time the kids change robot design, they need to assume it will affect all of their programming (or at least check)



Veteran Tips and Tricks that Save Time

Pay attention to the layout of programming code

- Build good habits early
- Don't put too many commands on a single line
 - ✓ It makes it harder to run segments of code
 - ✓ Harder to see the code
 - ✓ Harder to find the code you're looking for



Veteran Tips and Tricks that Save Time

Use MyBlocks

- Think about the actions you'll repeat frequently
 - Line finding
 - Line following
 - Line squaring
 - Pivoting a specified angle
 - Squaring to a wall
 - Driving a distance in cm
 - ...



More Tips and Tricks

Understand how sensors work before designing the robot around them.

- For example, understand color sensor calibration.
- Learn about measuring distance using wheel motor sensors.
- Read about ways to use the gyro.



More Tips and Tricks

Eliminate avoidable causes of variability.

- Have your kids develop a checklist of things that make the robot operate less predictably.
- Keep your batteries fully charged, your table wiped clean, and wheels clean.



More Tips and Tricks

Plan for failure.

- Think about if the robot fails to complete a mission, how it will fail, and if the robot can recover and continue its run without penalty.



Questions?

*Please share your tips & tricks
on the
FIRST Washington FLL Coaches Group
on Facebook!
(<https://www.facebook.com/groups/FIRST.Washington.FLL/>)*

