

# CAREER READINESS

CHALLENGE | KAI BUSJRA, VEX IQ TEAM 2998A, BELLEVUE WASHINGTON



# 2023-2024 CAREER READINESS CHALLENGE

HEY, HOW DO GROWN-UPS USE AND WRITE DOWN ALL THE COOL STEPS IN MAKING STUFF WITH ENGINEERING?



**I got to find a company that makes awesome robots and see what they're up to. Then, I check out my robot team and think about how all of it can help me be super good at robots when I grow up and get a cool job.**

# STEM CAREER COMPANY SELECTED: AMAZON

- I picked Amazon for my challenge! They sell everything online, and they are from where I live. I know they have a couple of robots because I heard about it from the news my dad watches.
  - AMAZON robots I know are

## SCOUT

It can deliver a package to the sidewalk by your house



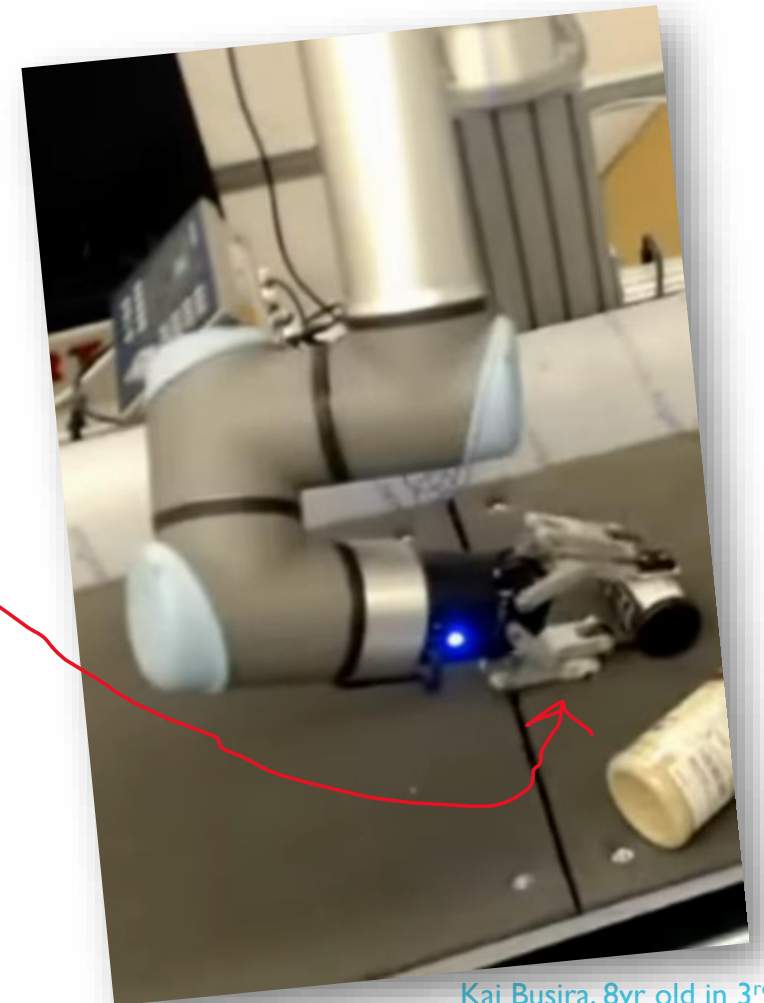
## DRIVE-UNIT

It can move shelves with stuff in warehouse helping people there get them



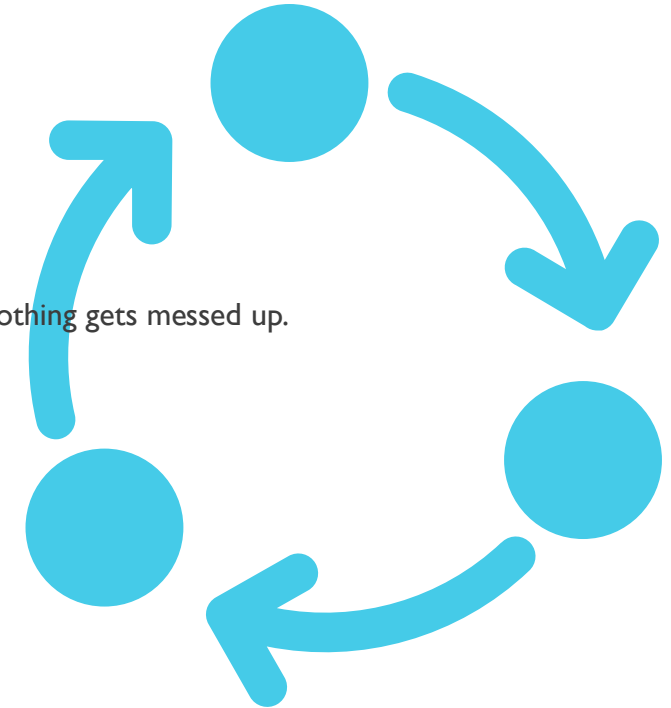
# RESOURCES USED TO FIND OUT ABOUT AMAZON PROFESSIONALS

- I talked to someone who works at Amazon named Fanqi! He's my teammate's dad from my VEX IQ ES team 2998A.
- I did an interview with him on my dad's phone.
- Found out Amazon makes a bunch more robots! The robot Fanqi works on is like a cool arm with two fingers that pinch. It grabs stuff from shelves and gives them to people. I decided to call it "Pinjy" cause it doesn't have a name. Makes sense I never heard of it.
- Fanqi told me to look at some YouTube. (I swear Dad, truth!)
  - [Pinch Robot Arm](#) – Pinjy's grampa
  - [Suck Robot Arm](#)
  - [Autonomous Robot](#)



# HOW DO PROFESSIONALS APPLY DESIGN ENGINEERING PROCESS

- Fanqi told me it's a super tricky thing they're working on at Amazon. It needs lots of teams to work together, like Hardware Engineers, Software Engineers, and a bunch of Project Managers.
- They use something like our Design Engineering Process, and it goes like this
  - **Define**
    - They decide to use robots to help put stuff on shelves in fulfillment centers.
    - They figure out what they need by watching how people do it now.
    - They want a robot that can grab things from a conveyor belt and put them on shelves just right, all gentle so nothing gets messed up.
  - **Develop Solution**
    - The robot needs to be able to move around in a tiny space, pick things up, and "see" with fancy scanning.
    - It's like a BIG ARM with two fingers that pinch and grab things.
    - The robot needs to know where it is and where it is going.
  - **Optimize**
    - They look at two big things: "Drop Rate" and "Damage Rate".
    - Drop Rate problem: Sometimes the robot drops things, and they can't get them back. Solution: Make the arm better with conveyor belts along the fingers.
    - Damage Rate problem: Sometimes the robot squishes stuff too hard. Solution: Make the robot know how hard to hold things based on what they are.
- It's like a big puzzle they're solving to make sure the robot does an awesome job!



# PROFESSIONAL COMPARED TO VEX IQ TEAM

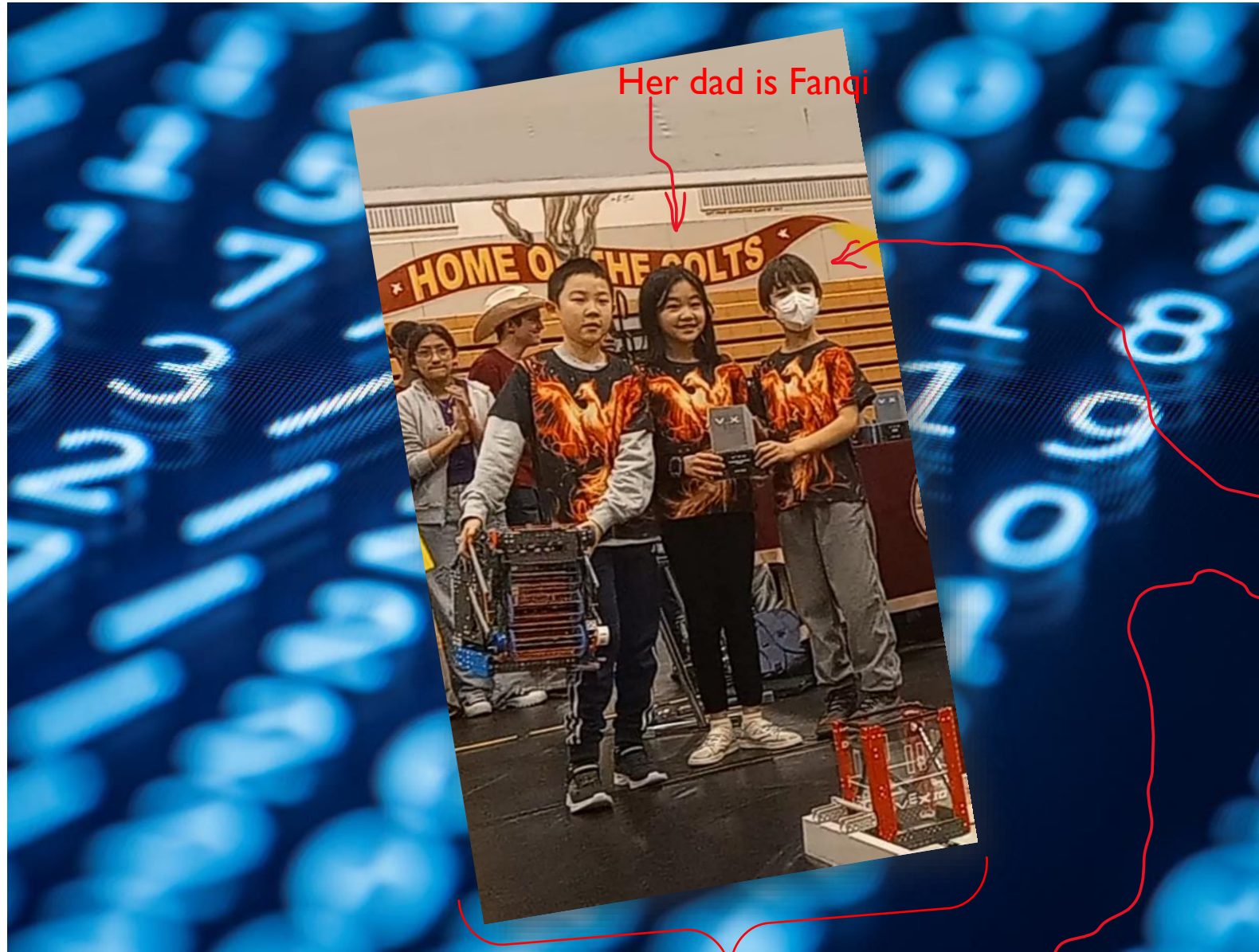
Step	Professional in AMAZON	VEX IQ Elementary School Team
Define	They look at how people work and try to make a robot to do that instead	We design a robot based on game rules, based on our own ideas, mindset, and other teams
Develop Solutions	They develop Pinjy the robot with things needed to do the job that person used to do, like see things and know where those things go. They ended up with an arm and two pinch fingers.	We drive the robot a lot and wait for it to break, then figure out the problem, make it different so we don't have that problem anymore. We do this again and again. After a while robot is fully fixed and it does not break. (Until we break it...) 😂 We ended up with a box on wheels.
Optimize	They measure two things. <ol style="list-style-type: none"> <li>1. How many things Pinjy drops. They fix the problem by rebuilding the robot.</li> <li>2. How many things Pinjy crushes. They fix this problem by changing the code.</li> </ol>	We also look at two things, but very different. <ol style="list-style-type: none"> <li>1. What still breaks on the robot. We just fix.</li> <li>2. What is our score. We fix it by changing the route strategy and the way we drive and program the robot.</li> </ol>



# HOW HAS VEX ROBOTICS PREPARED ME FOR A FUTURE CAREER

- If I work on robots as my career, I already know some tips from doing robotics earlier in my lifetime.
- I have already used the Engineering Design Process and professionals also use it.
  - (One tip - if it breaks just rebuild it and test again)
- I practiced typing on a computer for this challenge 😊
  - (Too much, not easy, took days)
- I know that if I work super hard and
  - get really good at something
  - it's gonna be so much fun!
  - Just like VEX Robotics competition!!!





Her dad is Fangqi

# THANK YOU SO MUCH

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