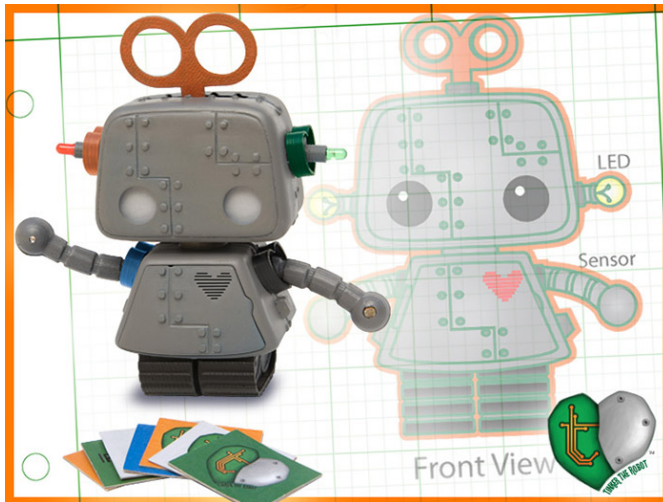


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## Coding with Colorful Cards: Kids Learn Arduino-based Code with Tinker the Robot



*Tinker the Robot*

Meet Tinker the Robot. UC San Diego mechanical engineering alumnus (2007) Kay Yang created him to teach and inspire young children to play with robots.

As a little girl, Kay loved taking things apart and learning how they worked – except electronics. She couldn’t understand how an electronic circuit could bring an object to life.

It wasn’t until she came to UC San Diego and enrolled in mechanical and aerospace engineering professor Nate Delson’s Introduction to Engineering Graphics and

Design (MAE3) course – where students design and produce robots from scratch for a competition – that she began to understand how electronics and code work together.

As Director of UC San Diego’s Mechanical Engineering Design Center, Nate Delson believes in project-based learning.

“It was the first time I got to play with robots, code and CAD software,” said Yang. “I learned that mechanical engineering was a great fit for me, but I felt that I was at a disadvantage because I hadn’t been introduced to these concepts at an earlier age.”

After college, Yang worked as a system engineer at a biotechnology startup company. There, she was part of a team of biologists, chemists, physicists and engineers that built an automated bio-threat detection system.

She was also a finalist in the Walt Disney Imaginations competition – Yang and her partner submitted a theme park attraction inspired by the movie Ratatouille and were invited to Imagineering headquarters to present the concept to senior executives.

Before creating Tinker, Yang brought toys to life at a major toy company as a project manager, where she was responsible for managing the toy life cycle, from conception to production.

At this point, Yang says she felt empowered to create something that would expose young children to electronics – that’s where Tinker comes in.

“Now is such a great time for makers,” said Yang. “I was able to purchase a 3D printer and I’ve been producing all of my prototypes with it,” said Yang.

Tinker the robot is designed to appeal to both girls and boys – complete with an LED heart and motorized tracks – and to break down the process of coding and hardware.

“Each accessory is either an LED light or a sensor,” said Yang. “Using color-coded cards, kids can direct Tinker’s actions. The cards tell Tinker to turn an accessory light on or off and how to react to feedback from his sensors.”

The majority of programming is logic, says Yang, and once you work out the logic, it’s easy to insert the programming language.

Here are three more things you should know about Tinker:

1. Because Tinker uses Arduino-based code, kids who graduate from using the cards can plug him into the computer and reprogram him using C Programming.
2. Tinker can also be an art project. Kids can draw on most of his hardware, giving them the opportunity to use their imaginations to make Tinker their own.
3. He also comes with a downloadable lab notebook, designed to expose a child to scientific note-taking early on.

Yang hopes to be able to begin mass production as soon as possible.

“Our children are our future engineers, and I really believe Tinker can inspire them to be innovators,” said Yang.

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