Robot design worksheet

Sue Keay runs Data61's cyber-physical robotics lab at CSIRO

What does your day-to-day work look like?

I spend a lot of time talking to people. My program consists of 130 researchers and engineers and my role is to make sure that they are working on great projects in collaboration with other parts of CSIRO to benefit Australian industry and the community. I have to do a lot of talking to get people to understand what we do, why it is important, and to encourage the formation of research questions that my program can apply their amazing skills to help solve.

What led you to this career/job?

I'm a research scientist who originally specialised in earth sciences and I have since applied my skills to building large-scale, multi-disciplinary teams to solve challenges that are important to Australia. Cyber-physical systems are where we can apply digital technologies to the physical realm to come up with solutions using robotics, sensors, and computer vision that we've never been able to do in the past — so it is endlessly exciting.

The lab specialises in the creation of legged robots like the hexapod above.

What training do you have for this job?

I have a PhD in Earth Sciences and an MBA.

If you could change one thing about your industry/job what would it be?

I would like my industry to be 50:50 women and men. Our technologies should be developed by people who are representative of the society in which we live, which means there should be 50 per cent women contributing as opposed to the current 10 per cent.

What are the key skills, both technical and non-technical, you need to succeed in your job/industry?

An understanding of the scientific method, an ability to cut through technical jargon to understand the essence of research problems (and why they are important), and an ability to communicate this information to others.

If you had one piece of advice for young people getting into your industry, what would it be?

Stick with maths and science. In an increasingly technology-dependent society you need to be confident you understand how these technologies are developed and be empowered to have your say in whether or not particular technologies are good for our society.

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Sue and her team use **biomimicry** as the inspiration for their robot design.

Living things | To copy
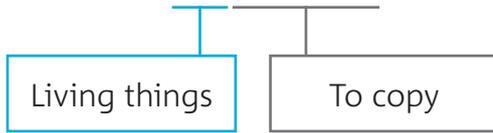
Identify 5 features or abilities of a spider that could be inspiration and explain how you will use it in a robot design.

Feature 1:

Use / uses in nature:

Will be used in the robot to:

Feature 2:

Use / uses in nature:

Will be used in the robot to:

Feature 4:

Use / uses in nature:

Will be used in the robot to:

Feature 3:

Use / uses in nature:

Will be used in the robot to:

Feature 5:

Use / uses in nature:

Will be used in the robot to:

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B&M | 20-00166

Use research to find a problem that could be improved with a robot

Sue and her team are always looking for new and exciting robot designs to solve some of the world's biggest problems.

Identify a problem you want to help fix and use **biomimicry to design** a robot to present to Sue Keay and her team.

Problem

Describe the problem in a sentence or two:

Context

Who or what does this problem affect?

Solution

Identify the goals of your robot?

Biomimicry and robot design

Develop

Identify 5 features or abilities your inspiration uses in nature and explain how you will use it in your robot design.

Feature 1:

Use / uses in nature:

Will be used in the robot to:

Paste an image of
your inspiration here

Feature 2:

Use / uses in nature:

Will be used in the robot to:

Feature 4:

Use / uses in nature:

Will be used in the robot to:

Feature 3:

Use / uses in nature:

Will be used in the robot to:

Feature 5:

Use / uses in nature:

Will be used in the robot to:

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