



Engagement and Impact

Peta White and Russell Tytler

Contract research

- A negotiation of research aims and agendas
- Team building
- Confirmation and contract signing
- Doing the research
- Negotiating the reporting
- Designing the impact and engagement

The future of work and work futures....

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The 100 Jobs of the Future
The Future Jobs Explorer Tool/Quiz



There were three key features of the research that we needed to negotiate:

- Constructing the research in a way that maintained academic integrity, was innovative, and satisfied the need for the research output to be engaging for general public and young people;
- Constructing 100 jobs in a rigorous but imaginative way that would ground the ideas around future work; and
- Crafting a Job explorer tool that engaged people in thinking about their own skills and career preferences and that then led them to further explore work futures.

THE AIMS OF THE PROJECT

100 Jobs of the Future is a research project that aims to look at the future of work in an increasingly technologically-driven society. We investigated:

- major trends and issues associated with major drivers of change – technological disruption, scientific innovation, climate change, globalisation, and population changes;
- the changes in work that will occur in key industries and domains;
- the jobs that will emerge in the future as a result of these changes; and
- the skills and interests that are needed for these jobs.

Having identified 100 jobs that represent key work futures in major domains and industries, we have designed a 'job explorer tool' called the Future Job Quiz, to help young people think about work futures, and how their aptitudes, career interests and skills might lead them towards these jobs.





Cyborg Psychologist

THE PROJECT DESIGN

1. First, we looked at the research and writing around work futures – major reports, research papers, books by futurologists - to identify major trends and the implications of these for work in the next few decades.
2. Next, from this review we identified key domains such as agriculture, health, and games which are changing rapidly, and selected 11 experts familiar with cutting edge developments in these domains, who could tell us about trends, and future jobs.
3. We interviewed these experts, and from this constructed a picture of what future work would look like generally, and identified, using their testimony accompanied by more web-based exploration, 100 jobs that represent a picture of future work in these key domains.
4. Finally, drawing on the research report, we constructed the 'job explorer tool' to help young people think about future work, and how their aptitudes, career interests and skills might lead to interesting 'jobs of the future'.

MEET THE EXPERTS



Megan Brownlow
Pricewaterhouse
Coopers



Sheryl Connelly
Ford Motor Company



**Mark Harvey-
Sutton**
National Farmers
Federation



Daniel Johnson
Queensland University
of Technology



Ivan Neville
Department of Jobs



David Ramadge
eBay



Ben Rogers
National Farmers
Federation



Susan Thompson
City Futures Research
Centre



Jude Walker
FutureWorking



Xungai Wang
Deakin University -
Institute for Frontier
Materials

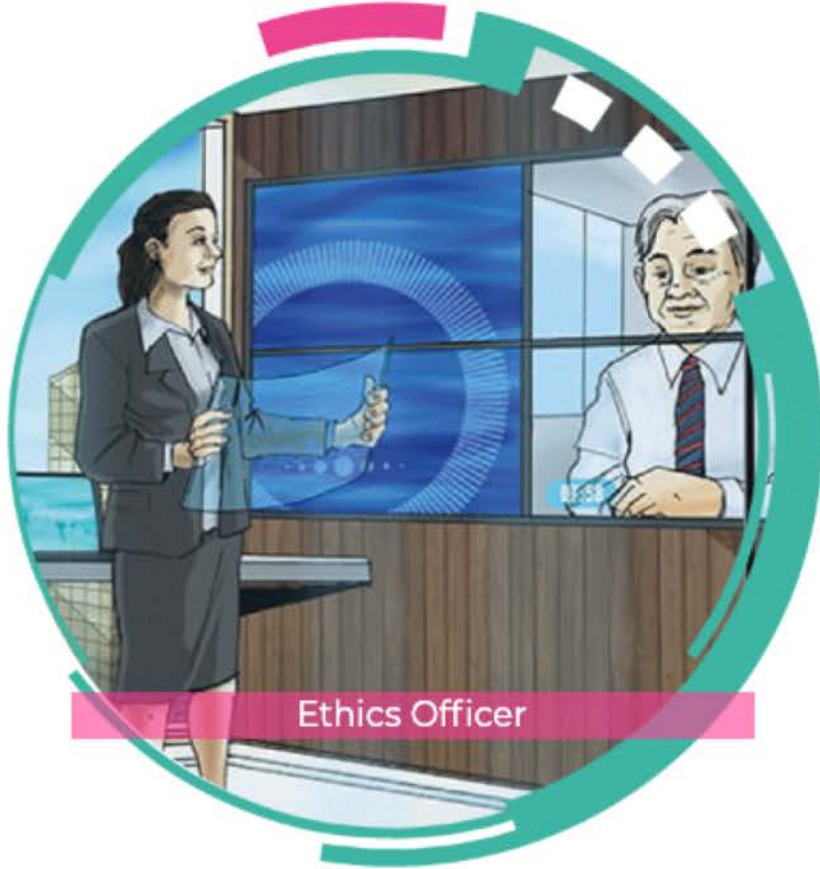


Sally Ann Williams
Google Australia

100 JOBS OF THE FUTURE

WHAT WILL WORK LOOK LIKE IN THE FUTURE?

If you are entering the workforce now you may have many jobs and even multiple careers over a lifetime! The future of work will involve people collaborating effectively with machines to do what neither can do alone. What jobs will be created in the future that don't currently exist? How can we prepare for future jobs? What skills will be needed?



Ethics Officer

KEY FINDINGS

The world of work will change dramatically in the next few decades. Even now, jobs are changing at a fast rate as machines and big data change the way we work and interact with each other.

An aging population, medical technologies, and disrupted workplaces will change people's life spans and career patterns. Climate change, population pressures and technologised lifestyles will throw up major challenges for sustainability. New technologies and new materials will change agricultural practice, transport, engineering, and industry and business practices.

This will all lead to major work disruptions, but open up possibilities for those with the skills and interests to match. Increasingly, jobs will involve humans working with machines, which means that future work will require people with technical/digital skills and those who can work at the interface between machines and people. We will have new jobs, and the jobs that exist now will change to include new technological and communication processes.

Many, but not all, of the 100 jobs of the future will require scientific and technological and digital skills. Many also require people skills, creativity and imagination, and the ability to work across domains and to learn and adapt.

HOW WE CONSTRUCTED THE JOBS EXPLORER TOOL

1. To construct the Jobs Explorer tool, we first identified the aptitudes, skill sets and career interests that matched each job. For these, we used the 'Holland code' typology which has been well researched and tested, identifying 6 'codes' to characterise peoples' major career interests.
2. Next, we designed an online quiz that identifies a code profile for each participant – Practical, Investigative, Social, Creative, Enterprising, Organised.
3. We divided the 100 jobs into 19 areas of work, such as 'advanced farming and food production', 'leisure and entertainment', or 'digital networks'.
4. Together with a preference for these areas of work, the coding enables us to identify future jobs matched to the responses.
5. Finally, we included in the advice for young people to further explore possible job futures linked to their profile, and the future jobs.



<https://100jobsofthefuture.com/>

What will future work look like for you?

In the future, could you be a robot ethicist? An offworld habitat designer? A personal brand manager? A biofilm plumber? A smart dust wrangler?

Everyone has characteristics that make them unique. Different people have different combinations of interests, aptitudes, and skills.

This job explorer tool has been designed to identify some of your career interests and aptitudes. It is not a fully detailed assessment — while you may have stronger interests in some areas than in others, you may also find that you can relate to more than one.

On the basis of your answers, the job explorer will recommend some of the '100 Jobs of the Future' that may be a fit for you.

Take the quiz ▶

<https://100jobsofthefuture.com/quiz/>

Order these statements from most like you at the top, to least like you at the bottom:

[Drag and drop to reorder](#)

I enjoy making or fixing things with my hands, using tools and equipment

I enjoy reading and thinking about solutions to problems

I enjoy using my artistic and creative talents

I enjoy teaching or helping others

I enjoy being in charge, leading and persuading others

I enjoy keeping records and organising things



Next >




Here is a list of areas of future work.

Select 2 to 3 to explore examples of future jobs in those areas

<input type="checkbox"/> Strengthening local communities and neighbourhoods	?	<input type="checkbox"/> Personalising information and communication	?	<input type="checkbox"/> Advanced farming and food production	?
<input type="checkbox"/> Leisure and entertainment	?	<input type="checkbox"/> Extended lifespans	?	<input type="checkbox"/> Education and lifelong learning	?
<input type="checkbox"/> Law and ethics	?	<input type="checkbox"/> Health and wellbeing	?	<input type="checkbox"/> Scientific discovery	?
<input type="checkbox"/> Environmental restoration and renewal	?	<input type="checkbox"/> Advanced city design	?	<input type="checkbox"/> Business innovation	?
<input type="checkbox"/> Space exploration	?	<input type="checkbox"/> Micro- and nano-technology	?	<input type="checkbox"/> Virtual and augmented reality	?
<input type="checkbox"/> Robotics and drones	?	<input type="checkbox"/> Artificial intelligence	?	<input type="checkbox"/> Digital networks	?



[See results](#) 

De-extinction geneticist

During the early Anthropocene (the geological period during which human activity started to be the dominant influence on climate and the environment, before ecology restoration began), many species of animals and plants became extinct.

About 40% of bird species, 30% of amphibians, and 55% of insect species disappeared during this time. Thankfully, governments realised the importance of healthy environments, and ecology restoration became a priority activity globally.

Most de-extinction and conservation geneticists work with ecology restoration workers to rebalance ecosystems. Some work in agriculture. However, some de-extinction and conservation geneticists work in novelty areas, bringing dinosaurs, aurochs, Tasmanian tigers and woolly mammoths back to life for wealthy people who want to own them as pets. This is a controversial area of de-extinction genetics, as reintroduction of extinct animals and plants can lead to harm to modern species, and cause imbalance in ecosystems.

De-extinction and conservation geneticists will have strong analytical, critical thinking, and problem solving skills. They will be good at maths and research, and have advanced qualifications in life sciences, genetics and the species they specialise in.

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Setting the future context

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The nature of the job

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Skills needed

Nostalgist



A nostalgist works to recreate remembered experiences for the elderly. Because people are so long lived, there will be a strong trade in recreating the best parts of life for people from 80 or 100 years ago.

Nostalgists can help people who suffer from dementia feel safer and happier, by building environments and experiences resembling the past and therefore familiar.

Nostalgists combine interior design expertise with personal digital research to design a personalised experience for their clients. People may wish to live in environments designed by nostalgists, or to visit them virtually with the assistance of a virtual reality experience creator.

Nostalgists have excellent digital research skills, and will be good at listening to people to elicit details of the required memories. They have a strong command of interior and environmental design, and may collaborate with other professionals, such as, virtual reality experience creators and aged health carers. A love of history and an eye for historical detail will be essential in this role.

Cricket farmer

People will turn towards more efficient protein sources.

Cricket farming will be an urban agriculture practice that produces large quantities of high-quality protein, micronutrients, calcium, zinc and heme iron (considered superior to plant-based iron).

Crickets consume plant products and produce very little waste making them an efficient energy source.

Vertical systems that require very little space where crickets thrive in optimal conditions will be designed. Robots and intelligent systems will monitor each cricket module, maintaining optimum growing conditions, monitoring inputs and growth rates.

Crickets will be turned into high protein flour for bread products and protein bars or deep fried to produce crispy snacks.

A cricket farmer will use a variety of technologies and have a high level of digital literacy. They will use robots to monitor the crickets, and be able to maintain the machines and programs. They will manage the cricket selective breeding program where they design a range of cricket varieties to match different market needs. They will design and test cricket products to fill an increasing variety of product niches. Cricket farmers will be good collaborators and skilled communicators as they will be a key player in the food production industry.

So... this project launched

- Website development
- 23rd July 2019
- 142 media hits on that day and more following
 - Radio
 - Print media
 - Television (The Project, Weekend Sunrise, Chanel 7)
 - Specific interviews (China News Agency – 12.5 million tweets, Toy Industry)
 - Deakin media (Deakin Disruptr, *.this*, Network)
 - Speaker invitations (Deans of Arts, Be Bendigo)

How this negotiation exemplifies discussions and actions towards engagement and impact of research?

What evidence is required to demonstrate engagement / impact?

What lessons are there for academic work more generally?

Thank you

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100 Jobs of the Future: Engagement and impact

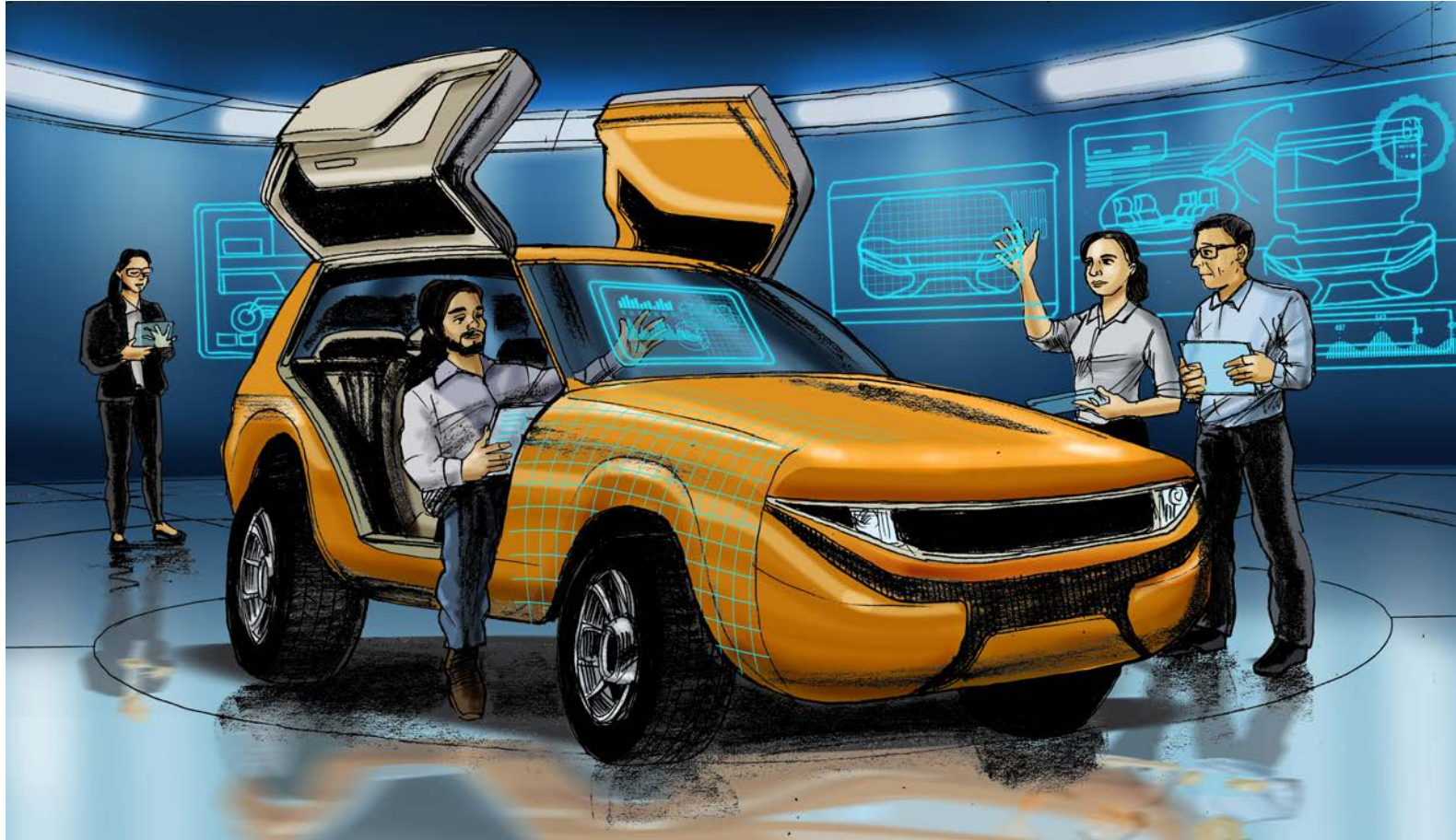
By Russell Tytler and Peta White

In this contract research, Ford Australia originally negotiated for the team to construct a report about future work, and future jobs, that would be relevant to youth in thinking about preparing for futures. However, the project was reconstructed to focus on ‘100 jobs’ and later a ‘future jobs quiz’. In this shift towards a more populist construction of the research, we considered whether and in what ways we could deliver the project with academic integrity. There were three key features of the research that we needed to negotiate:

1. Constructing the research in a way that maintained academic integrity, was innovative, and satisfied the need for the research output to be engaging for general public and young people;
2. Constructing 100 jobs in a rigorous but imaginative way that would ground the ideas around future work; and
3. Crafting a Job explorer tool that engaged people in thinking about their own skills and career preferences and that then led them to further explore work futures.

In this presentation we consider how this negotiation is central to notions of engagement and impact of research, and what lessons it contains for academic work more generally.

Auto Vehicle Designer



Chief Ethics Officer



Chief ethics officer

Chief ethics officers work in large companies and government organisations.

Their role is to ensure that corporate social responsibility is considered in all of the company's activities, and that the company is genuinely ethical in its practices.

The chief ethics officer oversees the company's adherence to zero waste policies, and its energy consumption and production targets. They make sure that the company is being socially inclusive, and its products and services are good for consumers.

It is widely recognised how expensive unethical behaviour can be (such as how much money is lost through not recycling or upcycling waste materials). Companies are committed to being as ethical as they can.

Chief ethics officer will also lead departments of staff and artificial intelligence units that are devoted to virtual ethics - such as making sure that unwanted social biases aren't creeping into algorithms, and that people's data is kept private.

Chief ethics officers keep up to date on the latest in robot and AI ethics. They have strong knowledge of the law, and professional/cultural codes of ethics related to their industry. They possess skills in critical thinking and problem-solving, and also management of information. Chief ethics officers lead teams, so they require people management and corporate leadership skills. They are good negotiators and mediators.

Human habitat designer



Human habitat designers develop and design land use and the built environment, including air, water, and the infrastructure of urban areas, such as transportation, communications, and distribution networks.

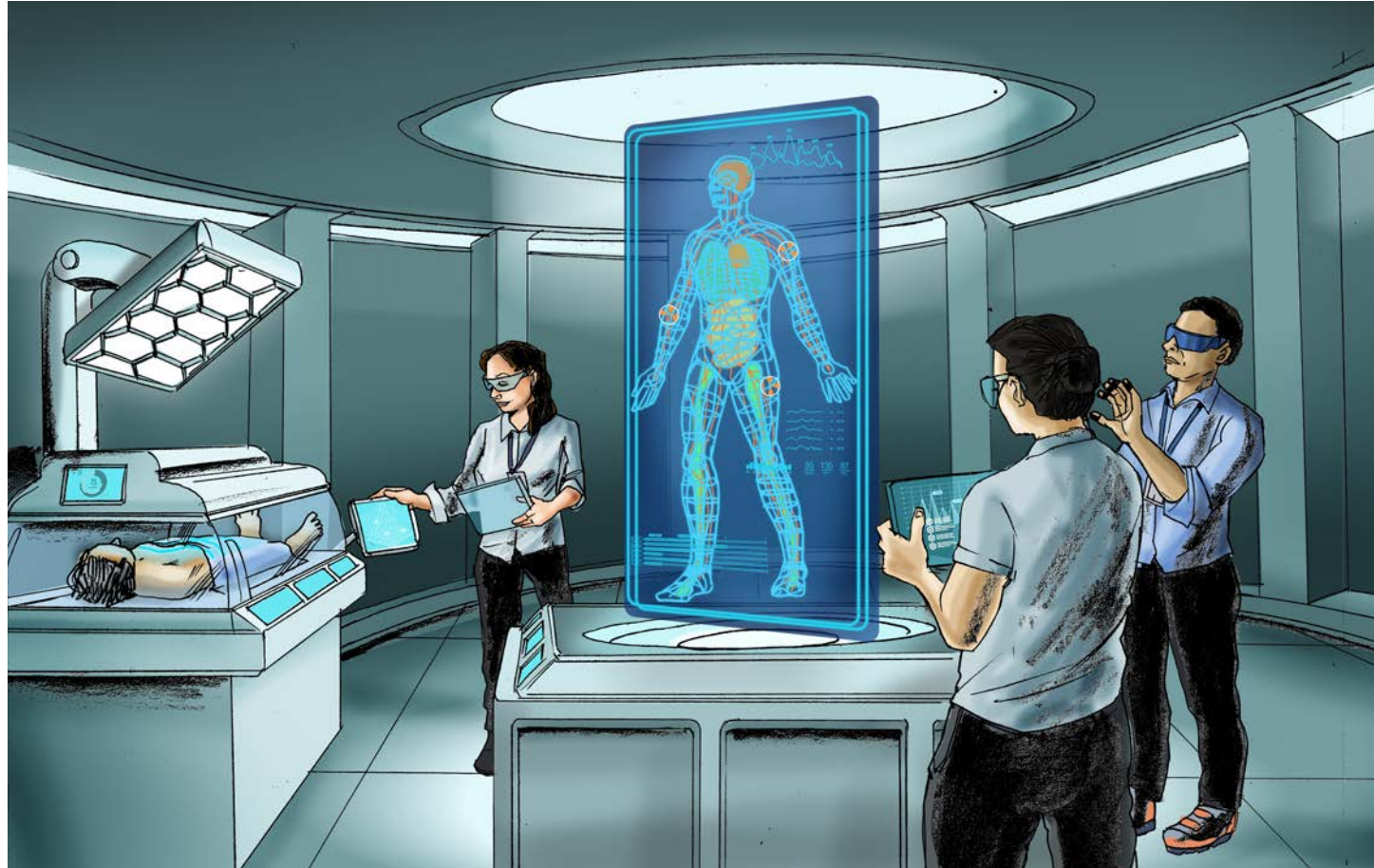
The number of people living in cities keeps increasing. As a result, human habitat designers have been designing smart cities with taller buildings, elevated transportation, vertical farming, and vertiports (aircraft and space shuttle ports with vertical runways).

They use regenerative theory, circular economy practices, and net positive design principles to build effective mass living and working arrangements. While millions of people live in these enormous vertical settlements, human habitat designers also focus on building local communities that enhance health and wellbeing. All buildings are constructed with environmental sustainability and ecosystem balance in mind, and are maintained in this way as well.

Human habitat designers rely on thousands of environmental sensors distributed through cities, the data from which are analysed using advanced algorithms to inform the design and maintenance processes.

Human habitat designers evolved from the urban planning profession. They have knowledge of planning theory, and may have an educational background in architecture, economics, environmental management or science, geography or sociology. They will be interested in social, economic, environmental, and cultural issues, and their intersection. They have good written and oral communication skills, attention to detail, and analytical and problem-solving skills. Their visuo-spatial skills are excellent, as are their digital literacies and ability to make sense of big data using algorithmic techniques.

Nano Medical Engineer



Robot ethicist



Ethicists are ethics experts.

A robot ethicist will be concerned with the ethical issues that are associated with artificial intelligence, robots, cyborg technologies, and augmented/virtual reality.

When a new technology or scenario involves emerging and contentious methods and applications where there are ethical or moral implications, an ethicist is frequently asked to provide input. They impart unbiased interpretations to help governments, businesses, professionals and families make informed decisions.

Key topics with which robot ethicists engage include robot rights (that people have moral obligations towards machines, particularly AI), weaponisation of AI, and robot morality. The robot ethicists analysis and input are aimed at preventing legal claims and making people feel confident and informed in their decisions.

Robot ethicists will understand logic and how it interacts with human emotions, beliefs and moral standards. They will listen to and comprehend a variety of different opinions based on multiple logical and philosophical approaches, and fairly assess them. They will have excellent analytical skills, and a contemporary understanding of ethics as applied to digital technologies.

Robot mechanic

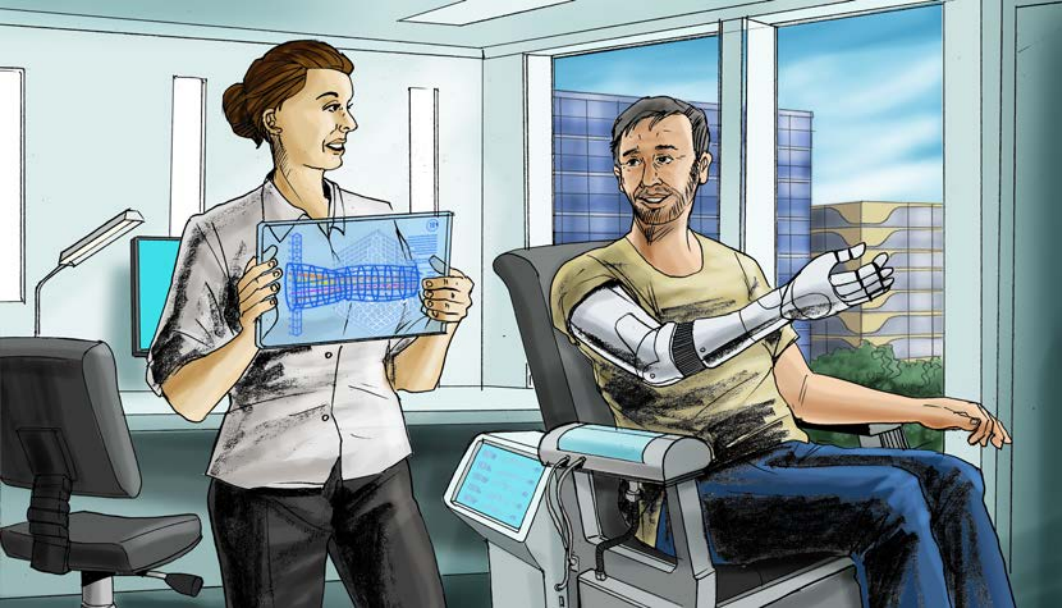


If your home assistance robot is malfunctioning, your autonomous car won't start, or your ag robot has ground to a halt in the middle of its vertical crop field, what do you do?

You contact your robot mechanic! Robot mechanics will maintain robots and autonomous vehicles to keep them running smoothly. Their work will include hardware maintenance and fixes (assisted by mechanic- assistance robots), but will also extend to electrical components, firmware and software updates and patches.

Remote and virtual assistance can also be part of this job, using augmented and virtual reality visualisation tools and robot self-repair systems.

Robot mechanics will have great diagnostic skills, problem-solving skills, and practical technical skills, in terms of both robot machinery and software. They will have good customer service capabilities, and excellent time management and organisational capacities. They will often be freelance or work in small robot garages (sometimes they offer mobile services), so need to be entrepreneurial in outlook.



Cyborg Psychologist

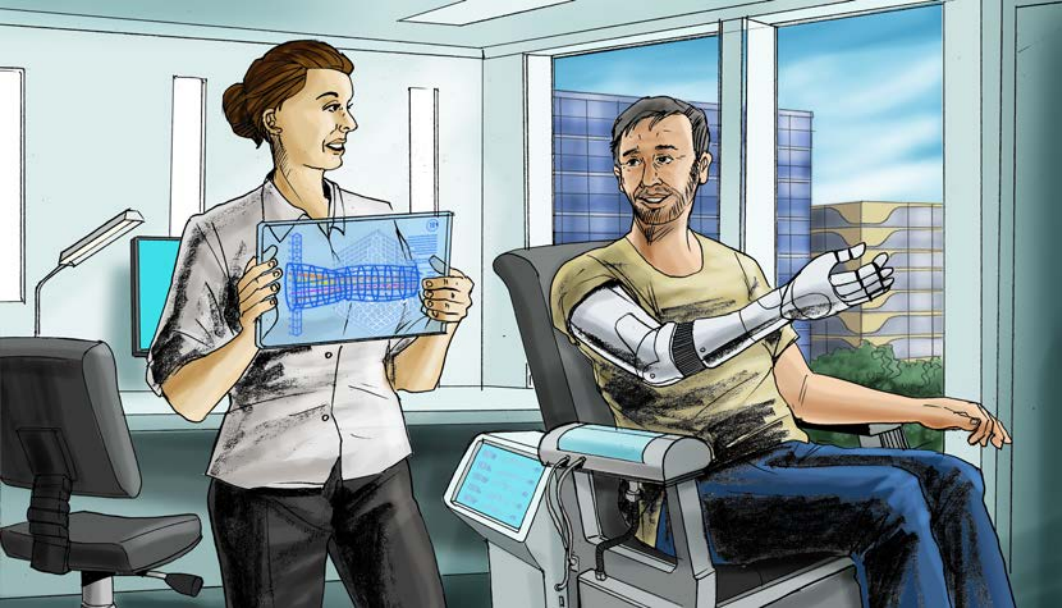
A cyborg psychologist will work with people who have synthetic organs, robotic limbs, and body implants, to help them come to terms living as cyborgs.

They will also help clients who are suffering from digital addictions and compulsions, or those who have been having trouble distinguishing between the physical and the virtual world.

Technological advances mean that nearly all people will have some level of technological enhancement. Virtual and augmented reality will be part of everyday life for millions. But some people may struggle with various aspects of their digitally enabled life so cyborg psychologists will be there to help them.

Given the challenges that their clients will be facing, they may use AR and VR-based interventions, or they may prefer to use traditional techniques that involve talking directly with clients, and supporting them in challenging situations.

Cyborg psychologists will need to relate to and empathise with a wide range of people. They will need to have excellent listening and oral communication skills, and the ability to cope with emotionally demanding situations. Cyborg psychologists will have in-depth knowledge of the impact of digital technologies on human psychological health and well-being, and of therapeutic techniques to address these.



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JOBS

BROWSE THE 100 JOBS OF THE FUTURE

All Technology jobs People jobs Business and Law jobs Environment jobs Urban jobs Agriculture jobs
Space jobs Health jobs Data jobs Experience jobs



HOW CAN I FIND OUT MORE?

Now that you have a sense of the type of work that might suit your career interests, it's a good idea to explore further. By learning more about different future jobs, you have a chance to try things out, decide if they are for you, and get a head start in building skills and experiences that will be useful later on.

You can find out more about the skills and experience that might be useful by reviewing the jobs you're interested in and thinking about what sort of things you'd be likely to do in those jobs. What skills or experiences would you be likely to need? Do these jobs involve working with a particular group of people, doing a particular task, or using a particular technology?

You can also search online for jobs that are in similar fields or doing similar things. For example, by looking at job ads, and just general Googling you can build up a good picture of the skills, knowledge and experience that will be useful in these roles. Then, you can explore ways to learn these skills and build up some experience, as a taster.

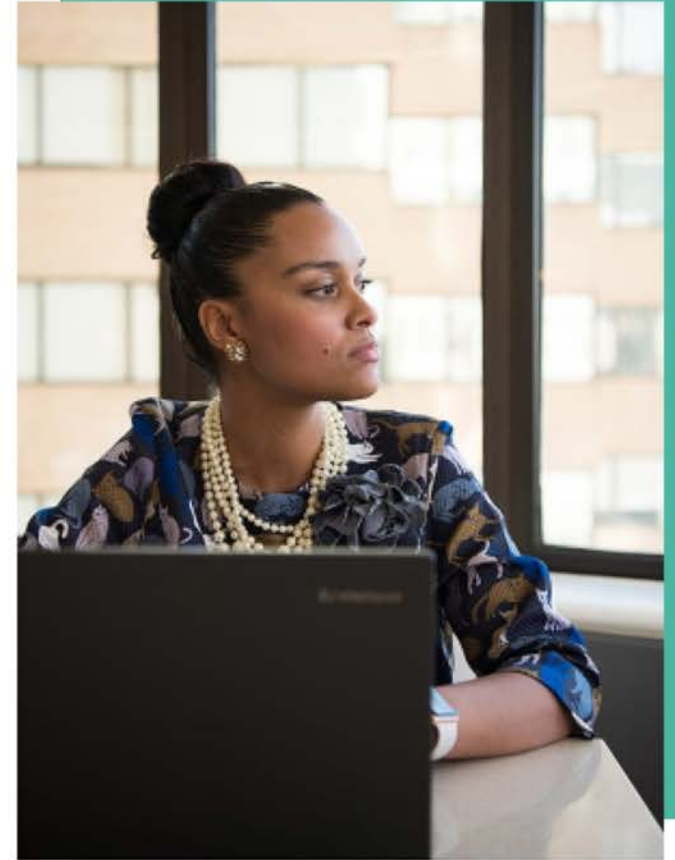
BUILDING ON YOUR STRENGTHS

When you're exploring what's out there, it helps to work with your strengths and preferences. The Jobs Explorer identified some of your career preferences, and it makes sense to work with those preferences. Don't feel that you're limited to only working within your style though!

Practical: If you scored highest in the Practical category, you might prefer to dive in and try new things. Practical experiences might be the most useful way for you to learn new skills and see if you like the areas you're exploring. Try volunteering, teaching yourself some new skills or techniques – just have a go!

Investigative: If you scored highest in the Investigative category, you might prefer to research privately online before you try anything practical. For Investigative people, online research is your friend! You might find that you can learn the most from researching trends independently.

Creative: If you scored highest in the Creative category, you might find the idea of having a plan for exploring your options is too rigid. Feel free to go where the wind takes you! If you find an interesting tangent when you're exploring your options, then dive in and learn more about it! You might also find that you prefer to get a group of friends together and try things out as a group, rather than going solo.



Social: If you scored highest in the Social category, you might find that you'll have a better time exploring your options in contact with other people. You could look into learning new skills or gaining new knowledge with a group of friends (why not get them to take the quiz too?) or perhaps join a club or society, where you can learn through interacting with other people. You might find that you get a lot out of volunteering, or by talking to people with relevant skills or experience.

Enterprising: If you scored highest in the Enterprising category, you might prefer to build your skills in a way that lets you see how much progress you've made. This can be as simple as tracking new knowledge, or doing more formal learning that has 'grades' or 'levels' to progress through. You might be interested in identifying the top people and companies in your field, and using their journeys as inspiration for your own. You may also enjoy exploring your options through talking to people who know about these areas or have relevant skills or experience.

Organised: If you scored highest in the Organised category, you might prefer a methodical approach to exploring your options. Take the time to create a plan (and clear goals!) for how you're going to approach things, and keep note of how your progress goes. You might seek out established clubs, societies or organisations, or people that can help you learn new skills, rather than going it alone.