# Upwardly mobile

As technology gets smaller, cheaper, and capable of new functions, devices like smartphones are becoming more powerful – all thanks to CS

## APP-SOLUTELY

Apps are essentially software programs: they "understand" certain basic functions, such as sending a text or playing a game, and execute these as they receive your instructions. They're coded in a variety of programming languages (like Microsoft's Xamarin), depending on your phone's operating system (OS) and what the app's creator was working with. "If you see yourself as imagining what the future might be, coding is where you could help realise it," says Professor Maurice Pagnucco from the UNSW Sydney.
**CS:** Computer programs (code)

## OPERATOR, PLEASE

The phone's OS (e.g. Android's Nougat) is its most important software program, as it enables the phone to run and coordinate multiple programs at once. The central processing unit (CPU) executes a few lines of code from each app at a time, and how they're cycled in and out is determined by the OS.
**CS:** Software (code)

## OK, GOOGLE

Another important program is your phone's voice-activated assistant (e.g. Google Assistant), which translates your words into a digital signal, then uses its vocabulary and language software to recognise the signal and respond.
**CS:** Software (code)

## STAY IN TOUCH

Touchscreens are capacitive, which means they're equipped with electronic sensors that register where our electricity-conducting fingers touch the screen. These sensors send a signal to the microprocessor, which works out what you're asking the phone's software to do.
**CS:** Electrical engineering (combining the technology of hardware and microprocessors)
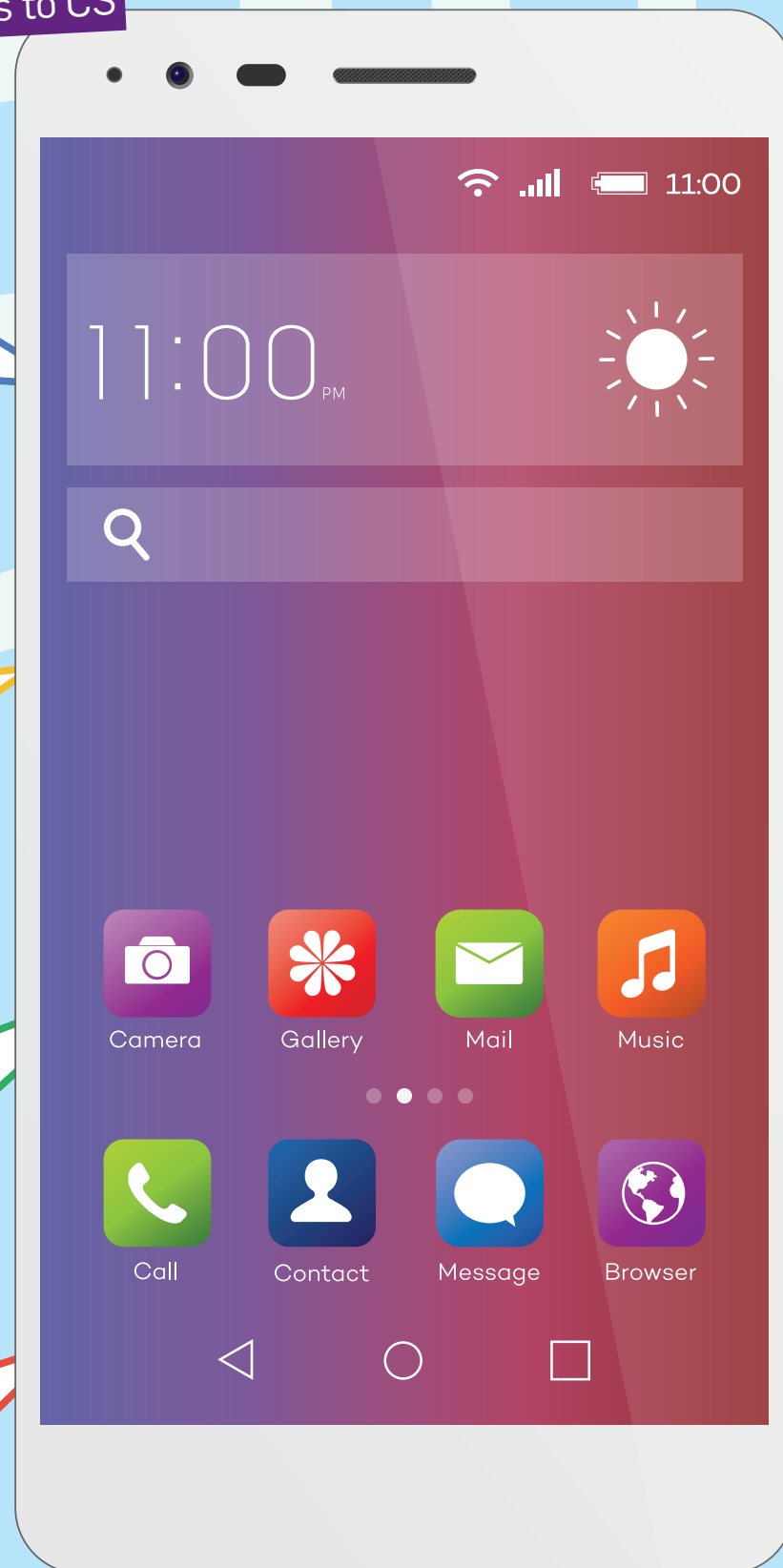
## GOING DIGITAL

When you make a phone call, the sound waves – your voice – are converted into a digital signal by the phone's microphone. This signal is transmitted to your friend's phone, and then converted back to sound by their phone's speaker.
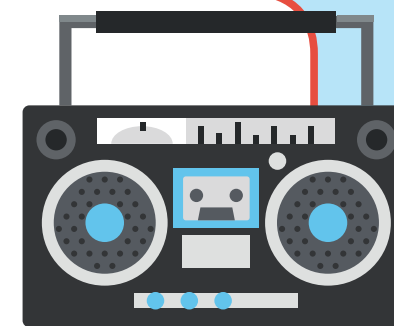**CS:** Hardware (microphone)

## TUNE IN

Bluetooth technology, in the form of a tiny computer chip and transceiver, uses low-power radio waves (between 2.402 GHz and 2.480 GHz) to connect smartphones with – and send data to – other devices, like a car's stereo, without using cables.
**CS:** Computer chips, transceiver

## IN THE CLOUDS

The cloud (internet) servers that allow us to access and store music, emails and other data and programs can be divided into two parts: the software interface that we interact with; and the data server storing this information on a remote computer, like at a Google data centre. Once we make a request, the two systems communicate via the internet and enable you to access or download the information.
**CS:** Distributed computing data storage

## EN ROUTE

A smartphone's built-in GPS receiver communicates via radio waves with at least three global positioning satellites to pinpoint your location. It then communicates the information to the phone's software so you can see your location and get directions to your destination.
**CS:** GPS satellites

Camera  Gallery  Mail  Music

Call  Contact  Message  Browser

11:00 PM

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# GET YOUR QUIZ ON!

FORGET EVERYTHING YOU THOUGHT YOU KNEW ABOUT CODING. IF YOU'RE INTO HUMAN RIGHTS, RETAIL THERAPY, CULTURE OR EVEN MUSIC, THEN YOU'RE INTO COMPUTER SCIENCE – AKA CODING, AKA COOL STUFF. WE'RE NOT KIDDING! GET READY TO FIND YOUR CS PATHWAY

GET STARTED!

## A: YOU LIVE TO HELP MAKE CHANGE. WHAT'S YOUR NUMERO UNO?

**#1 SAFETY FIRST**

OR

**#2 EARTH GOALS**

**HACKING HERO**

**COMMUNITY MINDED**

**SOLUTION SKILLS**

**MATCHMAKER**

### CS+CYBERSECURITY
You want people to feel safe online. Cybersecurity and the future of technology awaits you!

**CS+YOUR COUNTRY**

Finding the right combo between technologies of today and traditional cultures is your vibe.

**YOU COULD BECOME A GOVERNMENT CYBER SPY**

**YOU COULD USE CODING TO CONNECT CULTURES**

## B: YOU ARE ALL ABOUT CREATING THE FUTURE?

**#1 YOU LOVE ROBOTS**

**SHAKE THINGS UP**

**READY FOR CHANGE**

### CS+ARTIFICIAL INTELLIGENCE
Artificial Intelligence is leading the way in transforming, disrupting and creating jobs, solutions and skills for *all the industries*. Get on board.

**YOU COULD CREATE THINKING ROBOTS**

OR

**#2 LONG LIVE PEOPLE POWER**

**BORN LEADER**

**ON TREND**

**ALL ABOUT IDEAS**

**MARKET LEADER**

e-news

### CS+DISRUPTORS
So you've got an idea that's off-the-charts good? Get inspired by our *Careers with Code* entrepreneurs – the peeps who are wearing their CS hat to lead the way in new areas in technology.

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### CS+CREATIVITY
You're all about the latest tech. From the music you stream to the games you play and the gear you wear, it's all about delivery to the masses.

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# Code in creative careers

## What we wear and how we play is made with code

Whether it's fashion design; an artificial-intelligence assistant on your smartphone; augmented reality in the form of Snapchat filters; or tools for creating artworks, almost every aspect of our social lives are permeated by technology.

While she's now a rising tech star, this wasn't always the case for Charne Esterhuizen – when her father moved the family from South Africa for work, they slept on mattresses on the floor, as they adjusted to their new life in Australia.

Super friendly and talking a mile a minute, Charne takes the same unstoppable attitude her father had in relocating their family to following her own dream career path – as a fashion designer for the label she founded, MAAK Clothing.

Ultimately, this eco-designer, who works with 3D-printed materials, wants to use bioprinting techniques to ensure her fashion label has an environmental footprint of zero.

"We have doubled our production of waste during the past 20 years and I want to fight back, using bioprinting technology to create a fabric grown from cells that is beneficial for the environment."

Charne taught herself CAD (computer-aided design) to print the butterflies that make up her dress "fabric", and used 3D animation to figure out how to connect the pieces together.

"For one butterfly to be printed it takes five and a half hours ... and the dress consists of 130 to 150 butterflies," she laughs.

## CS+ CREATIVITY

### MAKE IT YOURSELF
Tinkercad: tinkercad.com
Ruby on Rails (app development): rubyonrails.org
Udemy UX design course: bit.ly/UdemyUX

### STUDY OPTIONS
Academy of Interactive Entertainment: aie.edu.au
Bachelor of IT and Creative Industries, QUT: bit.ly/QUT_ITCI
WebUX, free Open2Study course: bit.ly/WebUX_O2S

### SHARE THIS
Instagram: maak_clothing
Facebook: prettygreat

### HOT JOBS
Mobile app developer $49k–$120k*
Lead UX designer $92k–$140k
Senior Software Engineer/Developer/ Programmer $72k–$130k
Fashion designer $40k–$90k
*Salaries according to PayScale.com

## Love your work

### Michael Szewczyk gets paid to play games

There's something magical about the first time you write a program and then have it perform exactly how you wanted it to.

In my day-to-day job at Prettygreat, a cool little start-up that makes mobile phone games, I do a lot of programming and I design the code systems that all our games run on.

I'm most proud of our latest title, Crash Club. It's a real-time multiplayer game – you're playing with people all over the world, so as you can imagine it can make things quite tricky.

If you want to work in the games industry, then make a simple game in your own time; if you want to work in robotics, build robots – this shows you're passionate and interested, and you're immediately ahead of most other applicants.

LAUREN TROMPP/ BEN ASHMOLE