

# TECH@CS 2K18

2018

ANNUAL CS  
TECH MAGAZINE





# EDITORIAL CHIEF

**MR. DUDELA SAI PRASHANTH**

Assistant Professor

Dept. of CSE

# DESIGNER

**MR. JEHAD MOHAMED**

Third Year

Dept. of CSE

# EDITORIAL MEMBERS

## FACULTY

**MR. VIJAY C.P**

Assistant Professor

Dept. of CSE

**MS. SHWETHA**

Assistant Professor

Dept. of CSE

**MR. HARISHA**

Assistant Professor

Dept. of CSE

## STUDENTS

**RIYA BATRA**

Third Year

Dept. of CSE

**SRUJAN NAIK**

Second Year

Dept. of CSE

**MONISHA TARKAR**

Third Year

Dept. of CSE





# A WORD FROM THE HOD'S DESK

Dear Reader,

Greetings.

I feel privileged in presenting our department tech magazine "TECH@CSE-2K18", it is designed to showcase trending technologies and events and the tech talents of our students and faculty members.

With a sense of pride and satisfaction, I would like to say with the active support of management, Director, Principal faculty members and students, the department tech magazine has come alive .

I extend my thanks to my students and colleagues for being a part of the editorial board. With all the efforts and contributions put in by the faculty members and students; This would definitely create an impact in the minds of readers, by way of providing larger visibility and dimension to department.

**DR J V GORABAL**  
PROFESSOR AND HOD,CSE

# VISION

To be a globally recognized center for imparting quality technical education through innovative research and incubation with moral values in the field of computer science and engineering.

# MISSION

M1: Inculcating quality teaching learning process by creating in-house industry-institute interactions to meet the societal needs.

M2: Developing research and entrepreneurship culture in students and faculty to cultivate lifelong learning.

M3: Empowering professionals with strong ethical values and leadership abilities.

# PROGRAMME EDUCATIONAL OBJECTIVES (PEOS)

- Engage in solving real life problems by applying the gained technical knowledge and lifelong learning.
- To Encourage students for higher studies and indulge in research activities.
- To Excel as a team leader, entrepreneur and a member in multidisciplinary environment.
- Ability to apply modern tools, skills and techniques to develop software and hardware systems to meet the need of the modern society.
- Practice moral and ethical values to solve environmental and societal issues in the field of computer science and engineering.

## TRENDING

## ARTICLES

## PROJECTS

## SPOTLIGHT

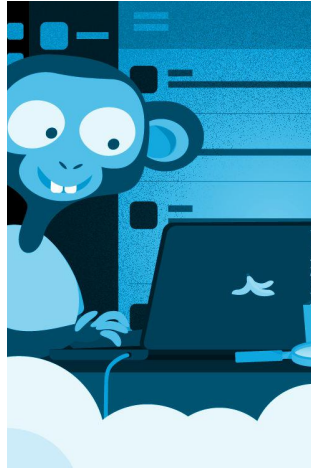


### 07 TOP TECH SKILLS FOR 2018

Surprisingly, A.I. is not on top of the list.

### 05 REAL-LIFE IRONMAN?

Rich Oil Trader builds flying suit. Sound familiar?



### 13 WHY DO PEOPLE OPEN SOURCE?

Why write code for free?

### 16 WHAT IS HASKELL?

What is functional programming and why and where do we use it? Why Haskell?



### 19 EMOTION BASED MUSIC PLAYER

Feel like crying? Boy do we have the right mix for you!

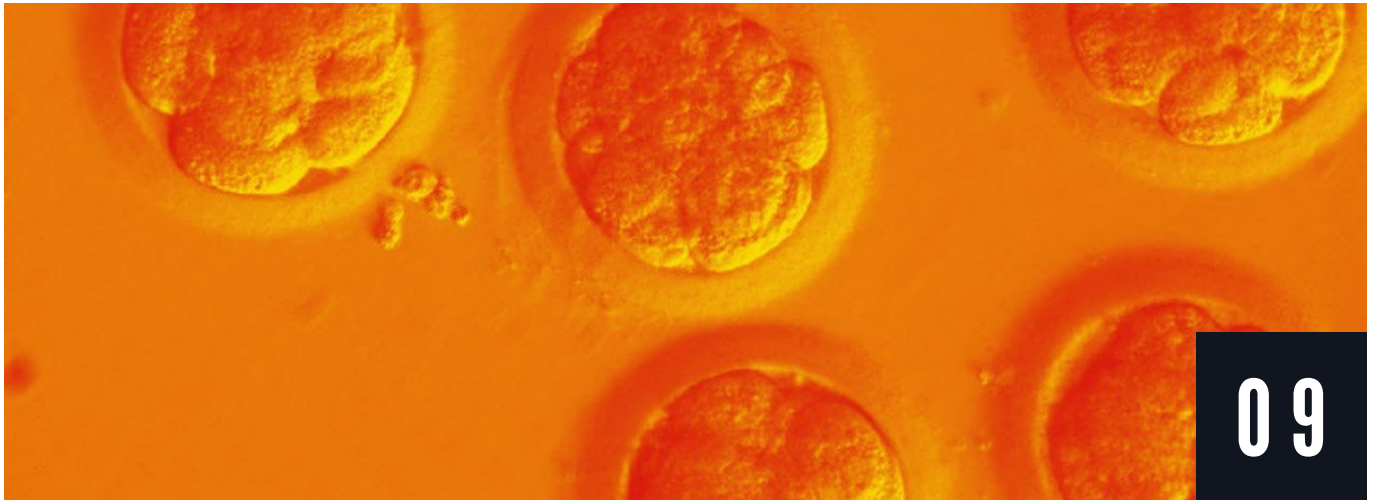
### 21 3DFY

Convert your 2D CAED Diagrams into 3D Renderings using Augmented Reality



### 27 WOMEN IN CODING

SOSWC: An initiative to bring more women into coding



09

### CHINESE SCIENTISTS ARE CREATING DESIGNER BABIES USING CRISPR

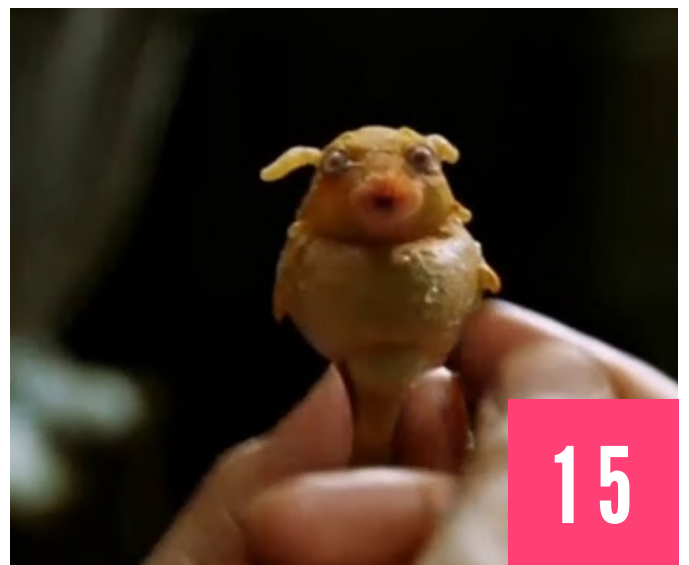
A daring effort is under way to create the first children whose DNA has been tailored using gene editing. Remarkable? Yes. Ethical? You decide.



23

### BUILD YOUR FIRST CHATBOT IN 5 MINUTES

5 Minutes. That's all it takes to build a minimal functioning chatbot.



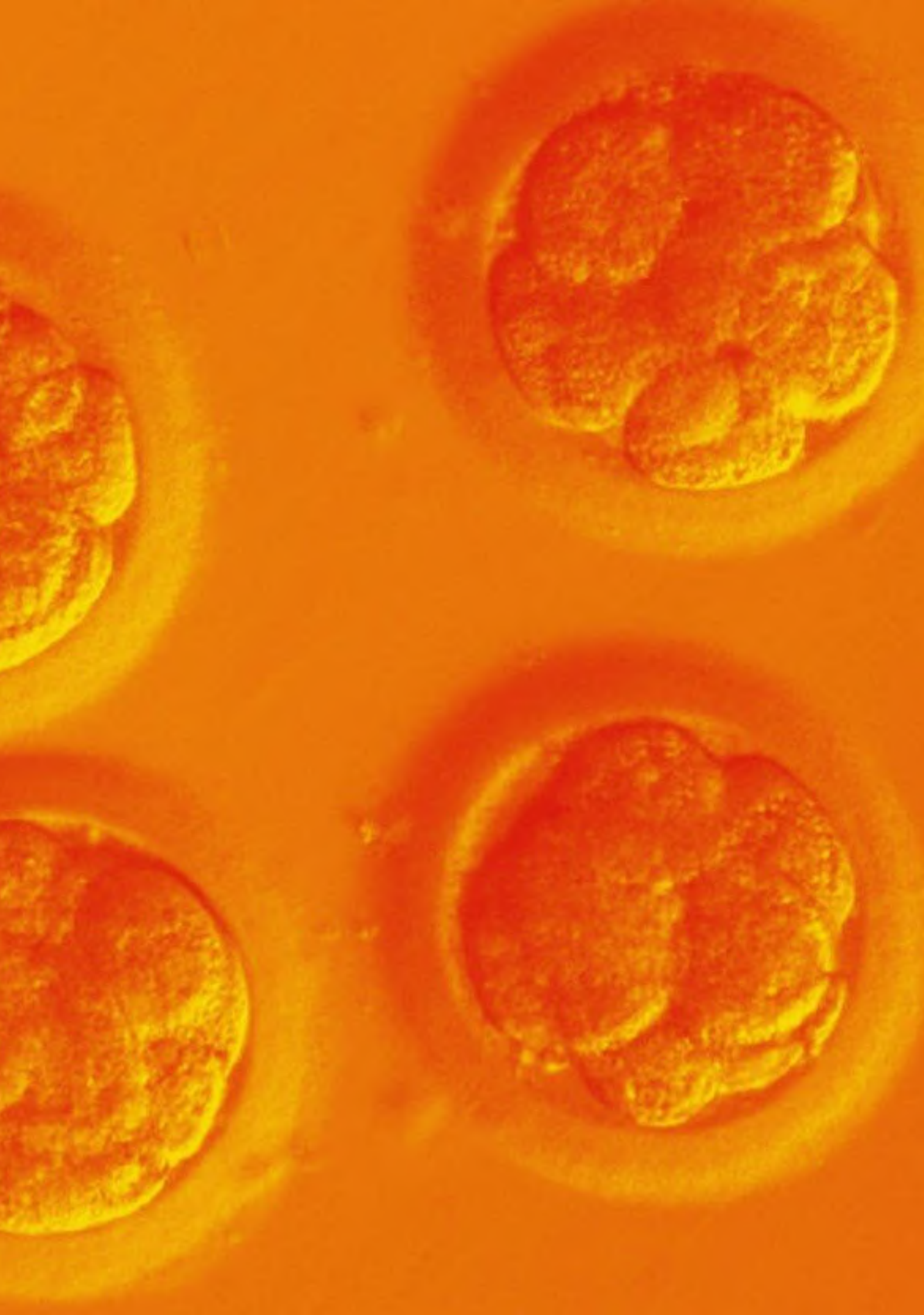
15

### BABEL-FISH EARBUDS

In Hitchhiker's Guide to the Galaxy, you slide a yellow Babel fish into your ear to get translations in an instant. Well Google made it. Sort of.

TRE  
NDI  
NG ;







# REAL-LIFE IRON MAN?

**Browning's jet suit is now officially on sale - for £340,000 (roughly ₹3,20,73,667).**

Richard Browning is ready for take off. He lights his engines, bends his knees, and the next minute he's ascending into the air. He hovers, defying gravity, before he begins to fly up and down an ordinary London street. This is Britain's real life "Iron Man" in action. Browning has created a state-of-the-art flying suit that rivals anything you've seen on the silver screen.



submitted by  
Srujan Naik, CS, 2nd Year

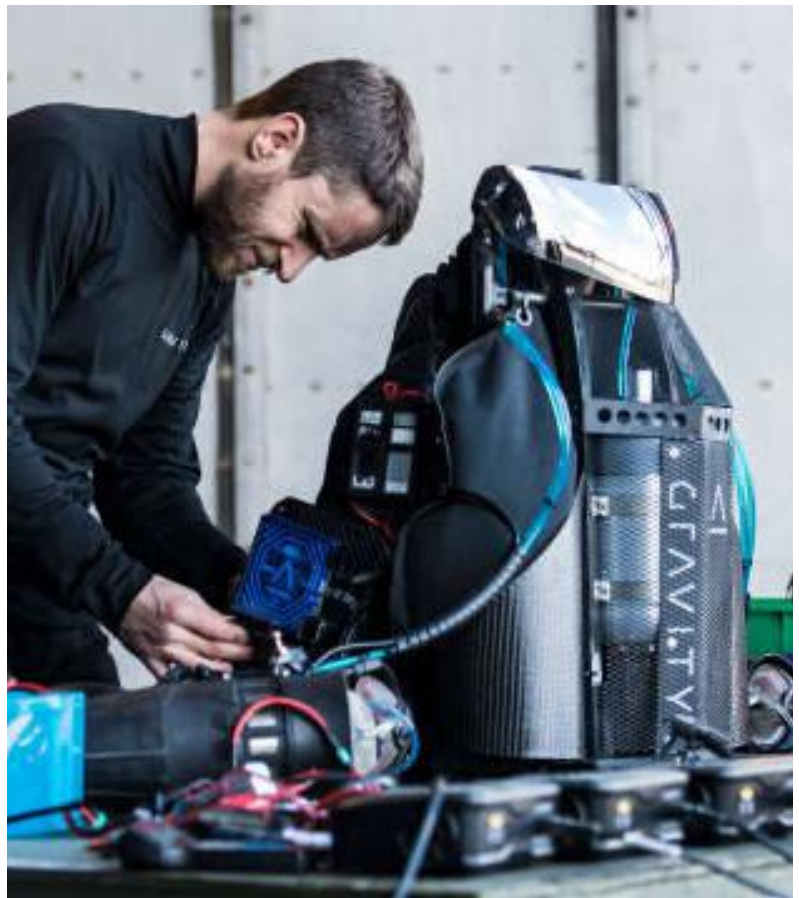


This incredible invention was built by Browning using 3D printed parts, specialist electronics and five jet engines. Once you've strapped it on and mastered the basics, you can soar at speeds of 32 miles per hour and ascend to altitudes of 12,000 feet.

"I get asked the question, why?" Browning, a 39-year-old former oil trader in the City of London, tells CNN Travel.

Browning began to experiment with creating a jet-powered flying suit, keeping it on the down low at first, to avoid raising expectations. "I started developing this idea of a novel form of human flight," he says. "And I honestly just did it alongside my day job in evenings and weekends." As the concept developed, he decided to take the leap from side project to main focus. "I think you only live life once and I didn't want to have the regret of not pursuing this," he says.

**Browning launched his flying company, Gravity, in Spring 2017, based from his home in Wiltshire.**



# TOP TECH SKILLS OF 2018

## 1. KOTLIN

New programming language Kotlin helps streamline Android app development. Kotlin v1.0 was released in February 2016 as an alternative to Java for Android app development. Java is an older language, verbose, error-prone, and has been slow to modernize. Kotlin is a new modern, sophisticated programming language that simplifies and streamlines the Android development process.

## 2. DEEP LEARNING

Deep Learning is pushing computing power into a new frontier. Artificial neural networks simulate neuron like connections and mimic how the human brain processes, stores, and acts on information.

The power of neural networks can be leveraged for just about every industry – from online retail (shopping cart analysis) and finance (credit card fraud prevention) to sports (winning games), healthcare (disease prevention), and agriculture (managing crops).



### 3. APACHE KAFKA

Apache Kafka integrates diverse data sources enabling companies to understand customer behavior. Apache Kafka is the engine behind internet companies like Twitter or Airbnb. By integrating diverse kinds of data such as likes, page clicks, searches, orders, shopping carts, and inventory, Apache Kafka feeds this data into predictive analytic engines that can analyze customer behavior

Apache Kafka's ability to integrate and synthesize valuable data can be a differentiator for businesses as they seek to innovate and stay one step ahead of competitors. But it's not just for internet startups; traditional large enterprises are also starting to take note of its advantages.

### 4. GRAPHQL

GraphQL is a data query language developed internally by Facebook in 2012 to improve mobile app performance. Almost every application pulls data from a remote data source such as a server. As mobile apps become more complex and data-rich, GraphQL optimizes mobile performance by redesigning data-fetching or how data is retrieved from servers to update mobile apps and webviews. GraphQL was publicly released in 2015 and provides an alternative to REST and ad-hoc web service architectures.

### 5. ETHEREUM

Ethereum is an open software platform based on blockchain technology. Ethereum blockchains are used by developers to build and deploy decentralized applications that are not controlled by any individual or central entity.



A microscopic image showing several human embryos in various stages of development, appearing as clusters of cells with a yellowish-orange hue. The title 'EDITING BABIES?' is overlaid in large white letters.

# EDITING BABIES?

## **Chinese scientists are creating CRISPR babies**

When Chinese researchers first edited the genes of a human embryo in a lab dish in 2015, it sparked global outcry and pleas from scientists not to make a baby using the technology, at least for the present. It was the invention of a powerful gene-editing tool, CRISPR, which is cheap and easy to deploy, that made the birth of humans genetically modified in an in vitro fertilization (IVF) center a theoretical possibility.

Now, it appears it may already be happening. According to Chinese medical documents posted online this month (here and here), a team at the Southern University of Science and Technology, in Shenzhen, has been recruiting couples in an effort to create the first gene-edited babies. They planned to eliminate a gene called CCR5 in hopes of rendering the offspring resistant to HIV, smallpox, and cholera.

The clinical trial documents describe a study in which CRISPR is employed to modify human embryos before they are transferred into women's uteruses. The scientist behind the effort, He Jiankui, did not reply to a list of questions about whether the undertaking had produced a live birth.

However, data submitted as part of the trial listing shows that genetic tests have been carried out on fetuses as late as 24 weeks, or six months.

The birth of the first genetically tailored humans would be a stunning medical achievement, for both He and China. But it will prove controversial, too. Where some see a new form of medicine that eliminates genetic disease, others see a slippery slope to enhancements, designer babies, and a new form of eugenics.

**Titled "Birth of Twins After Genome Editing for HIV Resistance," and 4,699 words long, the still unpublished paper was authored by He Jiankui, the Chinese biophysicist who created the edited twin girls.**

## The Lulu and Nana controversy

The Lulu and Nana controversy revolves around twin Chinese girls born in October 2018, who have been given the pseudonyms Lulu and Nana. According to the researcher, He Jiankui, the twins are the first germline genetically edited babies. He Jiankui has reported that the girls were born healthy. The girls' parents were participants in a clinical project run by He, in which he offered standard in vitro fertilization services and in addition, used CRISPR-Cas9, a technology that can modify DNA, to modify the CCR5 gene in the embryos that were generated, to attempt to confer genetic resistance to HIV. The clinical project was conducted secretly until November 2018.

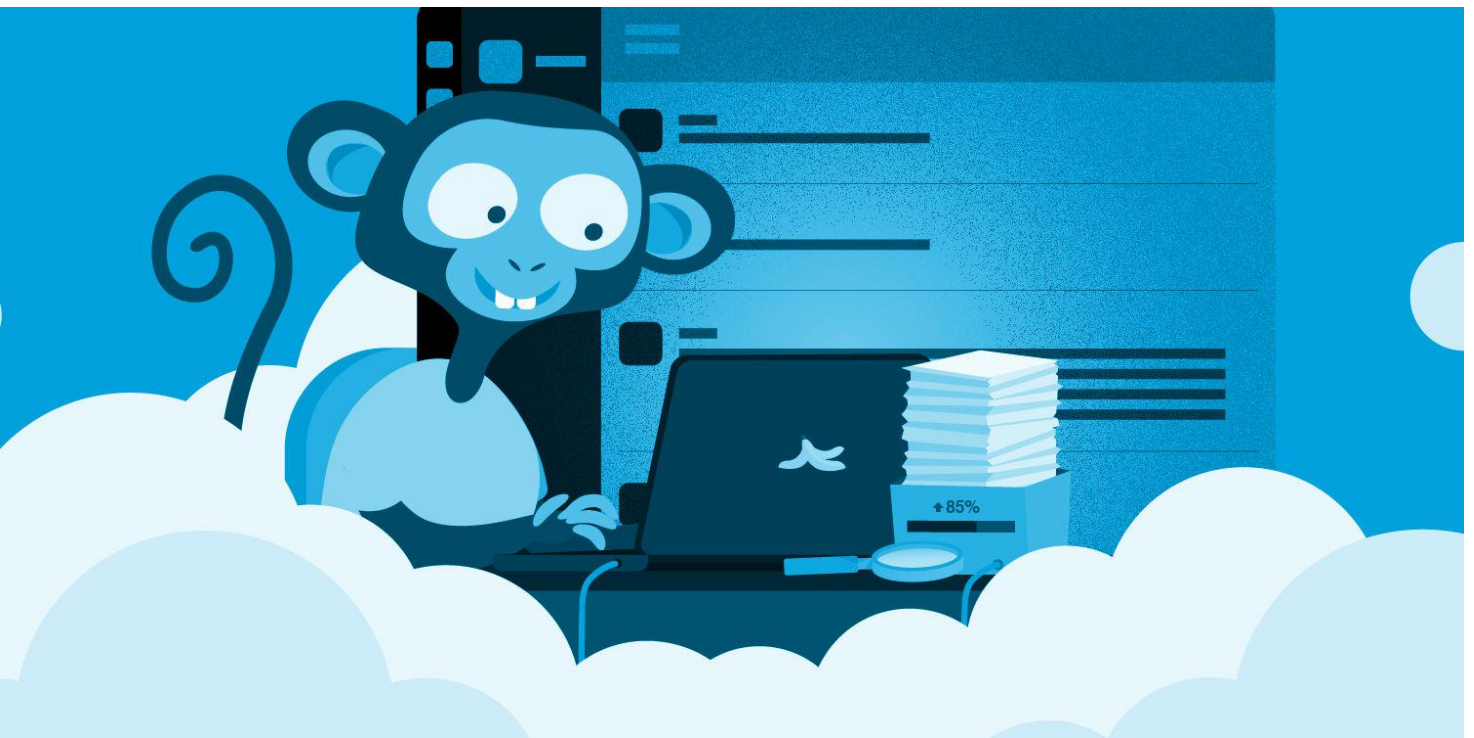


ART  
ICLES:  
ES;





# WHY DO PEOPLE OPENSOURCE?



**Why would you code for free?  
Why would you share something  
that you could profit from?  
Why do people contribute to Open  
Source?**

One of the questions that perplex many people. The concept of an open-source society or community where people write code and share without expecting any profit puzzles many. I had many questions when I first joined the Mozilla Campus Clubs in my first year of engineering. I'll be frank. I never really understood why we would contribute or share for free as open-source.



submitted by  
Jehad Mohamed, CS, 3rd Year

Until I reached my 3rd Year. I was a part of Mozilla CC's by then and had done a few cool projects, conducted a good number of workshops by then. But still, these questions lingered. I really didn't get a hold on it until the end of a particular event in our college. I was sitting with a particular senior (haxzie) who told me how and why he took up engineering and why he wanted to build this particular open source community. I'm not going to bore you with the details but what he told made me think about why am I part of the community. I was not really that active in the community. I was not a brainy coding maniac like my seniors or my teammates. I was a co-founder of a startup who sold code and design i.e. the opposite of open source. Even when I argued with some people about the community they bought up this in particular. So I took a step back and basically googled the crap out of this question.

I found a few obvious answers but it was a particular video about Open Design Foundation by **GARTH BRAITHWAITE** which really brought me to the light. This particular video was about why designers should open source. It really did bring a whole new perspective to the whole question. Instead of why am I a part of the community, I understood why I am a part of the community. Well, that's pretty much what inspired me to write about this question in particular. So do enjoy the list.

### **1. Giving Back to the Community**

Cheesy? yeah. But true. Most of what we use today from tools to languages are open-source, which is why it is important to give back to the community by contributing in any way possible.

### **2. People love a Challenge**

We love puzzles. They are the perfect way to mental stimulation, and what better way than to fix someone else's bugs or even solve someone's issue.

### **3. Enhancing your Skill**

Every line of code that you contribute to an open-source project is publicly accessible. The more you contribute, the more you shape the project. If that project ends up being a success, it reflects well on you. If it flops, it still shows your work ethic and coding expertise.

### **4. A Programmer's Portfolio**

Artists always point to their portfolio when applying for a position. Photographers show their portfolio when looking for new clients. The programming field is starting to head in this direction, at least in some ways. Your open-source contributions act as your portfolio.

### **5. Enjoyment Based Intrinsic Motivation**

A recent case study apparently found that this was the reason most people contribute to open source, surprisingly even more than strengthening your skills and resume. In layman's terms - for the good feels.

# BABEL-FISH EARPHONES

In the cult sci-fi classic *The Hitchhiker's Guide to the Galaxy*, you slide a yellow Babel fish into your ear to get translations in an instant. In the real world, Google has come up with an interim solution: a \$159 pair of earbuds, called Pixel Buds. These work with its Pixel smartphones and Google Translate app to produce practically real-time translation.

One person wears the earbuds, while the other holds a phone. The earbud wearer speaks in his or her language—English is the default—and the app translates the talking and plays it aloud on the phone. The person holding the phone responds; this response is translated and played through the earbuds.<sup>C</sup>



Google Translate already has a conversation feature, and its iOS and Android apps let two users speak as it automatically figures out what languages they're using and then translates them.



Scene from  
*The Hitchhiker's Guide to the Galaxy*



# WHAT IS HASKELL?

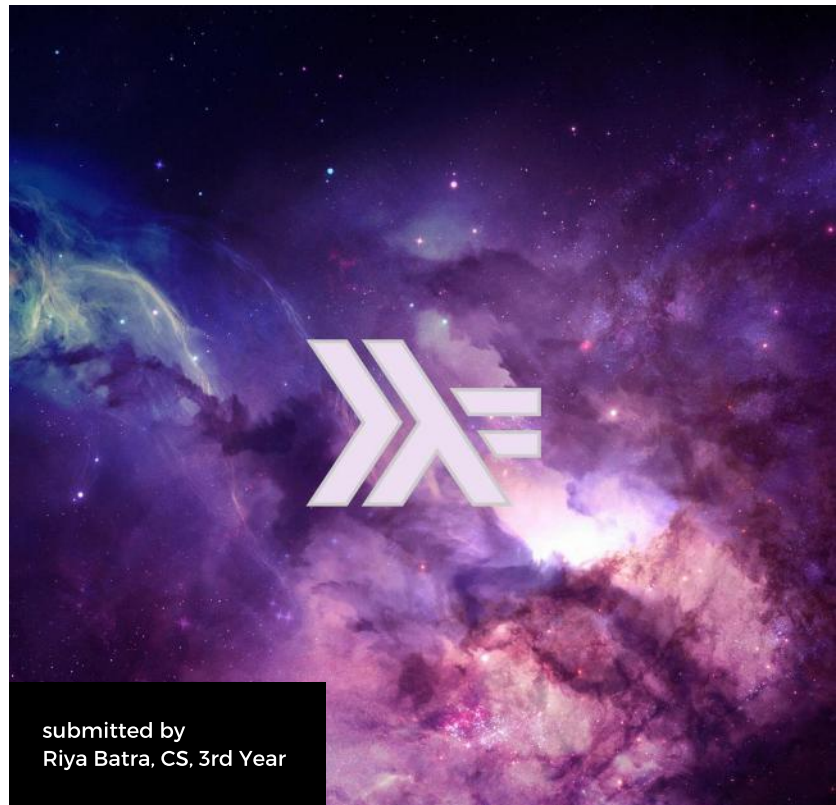
Functional programming is a programming paradigm in which we try to bind everything in pure mathematical functions style. It is a declarative type of programming style.

Its main focus is on “what to solve” in contrast to an imperative style where the main focus is “how to solve”.

It uses expressions instead of statements. An expression is evaluated to produce a value whereas a statement is executed to assign variables. Those functions have some special features discussed below.

Haskell is a functional programming language. In particular, it is a polymorphically statically typed, lazy, purely functional language, quite different from most other programming languages.

The language is named for Haskell Brooks Curry, whose work in mathematical logic serves as a foundation for functional languages. Haskell is based on the lambda calculus.



## Advantages of Haskell

- Small modules can be coded quickly and easily.
- General purpose modules can be reusable, which leads to faster development of next programs.
- The modules of a program can be tested independently, helping to reduce the time spent debugging.
- Functional programs are referentially transparent i.e. if a variable is assigned a certain value in a program, then this value cannot be changed again.

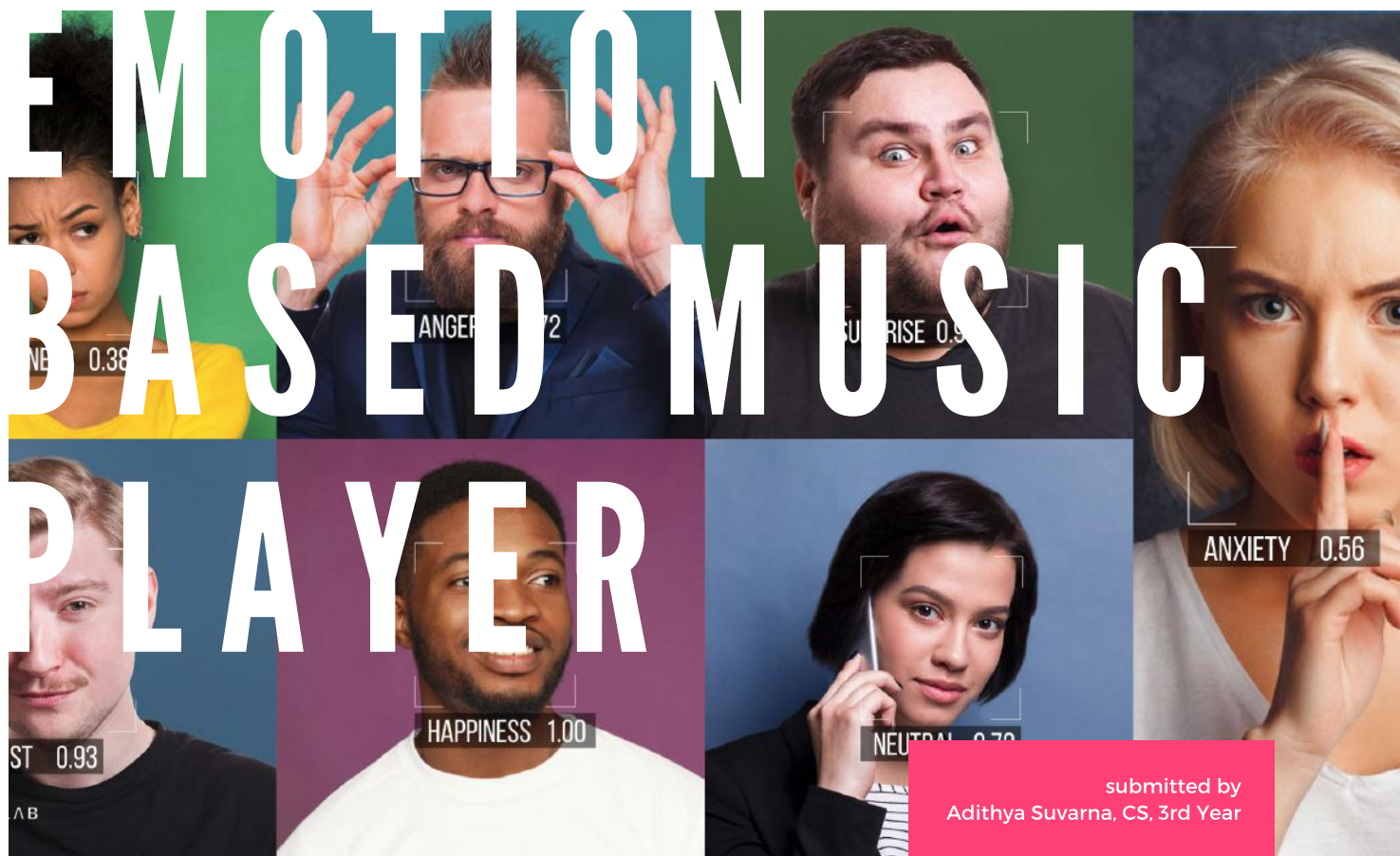
Another important Haskell benefit is performance and its fast prototyping capabilities. The huge difference with other fast prototyping languages such as Ruby and Python is that a Haskell prototype can become the real app and stand the test of time due to its conciseness and correctness.

**P R O  
J E C  
T S ;**









You get home from work, power up your laptop and ask it to play you some music. The computer knows which music you like because it houses your music library, so that goes well. But, you just had a tough day at work and are a still bit pissed, so from your entire music library you really would only like to hear a subset (that one death metal song). It could also be that you're over the moon and want to hear happy music. It would be cool to do this automatically, so let's give this a go!

## Tech Stack

Python - OpenCV

First let's think for a bit about what we really need. We need to be able to: detect a face on the webcam and pre-process the image of the face; grab some images of your face and dynamically update the model over time; detect the emotion on your face; pick a random song linked to that emotion and play it.

### Detecting your face on the webcam

First let's write a script that can detect faces on your webcam stream. We will use a pre-trained HAAR classifier supplied with OpenCV.

Get it from your OpenCV folder in "opencv\sources\data\haarcascades\", it's called **haarcascade\_frontalface\_default.xml**



If all goes well this should result in a red rectangle around all faces visible on the webcam feed. However, in my case there was strong sunlight coming from the side from a window, which created high contrasts and strong shadows on my face that hampered detection. A possible solution is to equalize the histogram a bit using an adaptive equalization technique.

### Processing the face

Great, we can detect faces! Before asking the classifier what emotion the face is displaying we need to crop and standardize it. The code I use in this tutorial is an adaptation of the one from the previous emotion recognition post. This extracts the face from the webcam stream and crops it.

If all works well you should get two streams; one with the webcam stream, another one with a cropped black & white face. This cropped window updates only when a face is successfully detected in the webcam stream. To predict the emotion accurately we might want to have more than one facial image. Blurred images can be an error source.

Another source is incorrect classification on a good image. Assuming that at least some of these detection errors are randomly distributed through the detection results, averaging classification over multiple images will improve results without much added hassle or much extra code, and it takes care of the blurred image problem too.

### Detecting the emotion in a face

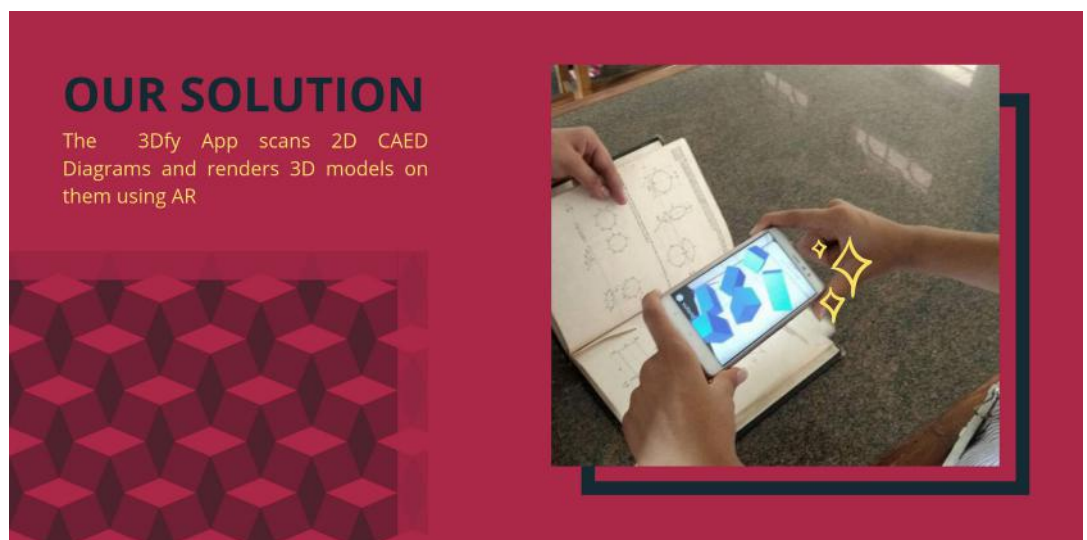
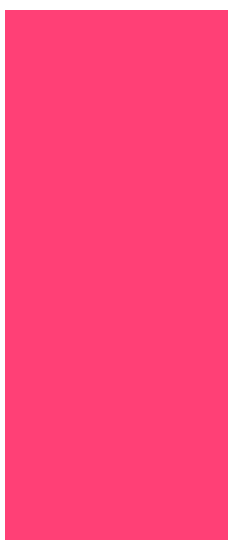
To detect the actual emotion on your face we could use a generalized model, but a better solution might be an individual one. Models trained on a single individual work much better when used on the same individual, often because in that case there is less variance between the data (here: facial features). If we minimise the variance by keeping the face the same, most of the detected differences will be due to the fact that a different emotion is expressed. You need to collect varied images of yourself to make this robust. This will present you with instructions on what emotion to express. The collected images are appended to the raw files and the model automatically updates itself.

### Selecting and playing the right music

Now that we have successfully detected the emotion on your face, and did some basic error reduction, playing the right music is easy. In this case the best way to open music files would be to use the infrastructure available on the target computers rather than some module that can open mp3's. To allow easy customization of the music attached to emotions we will use an excel file to easily add music files. In the columns you can put relative paths to the music you want opened if a certain emotion is detected.

**To get the code  
scan here!**





## HOW THE APP WORKS

All you need to do is put your mobile cam in front of a question and it augments the 3D model of the required sum.

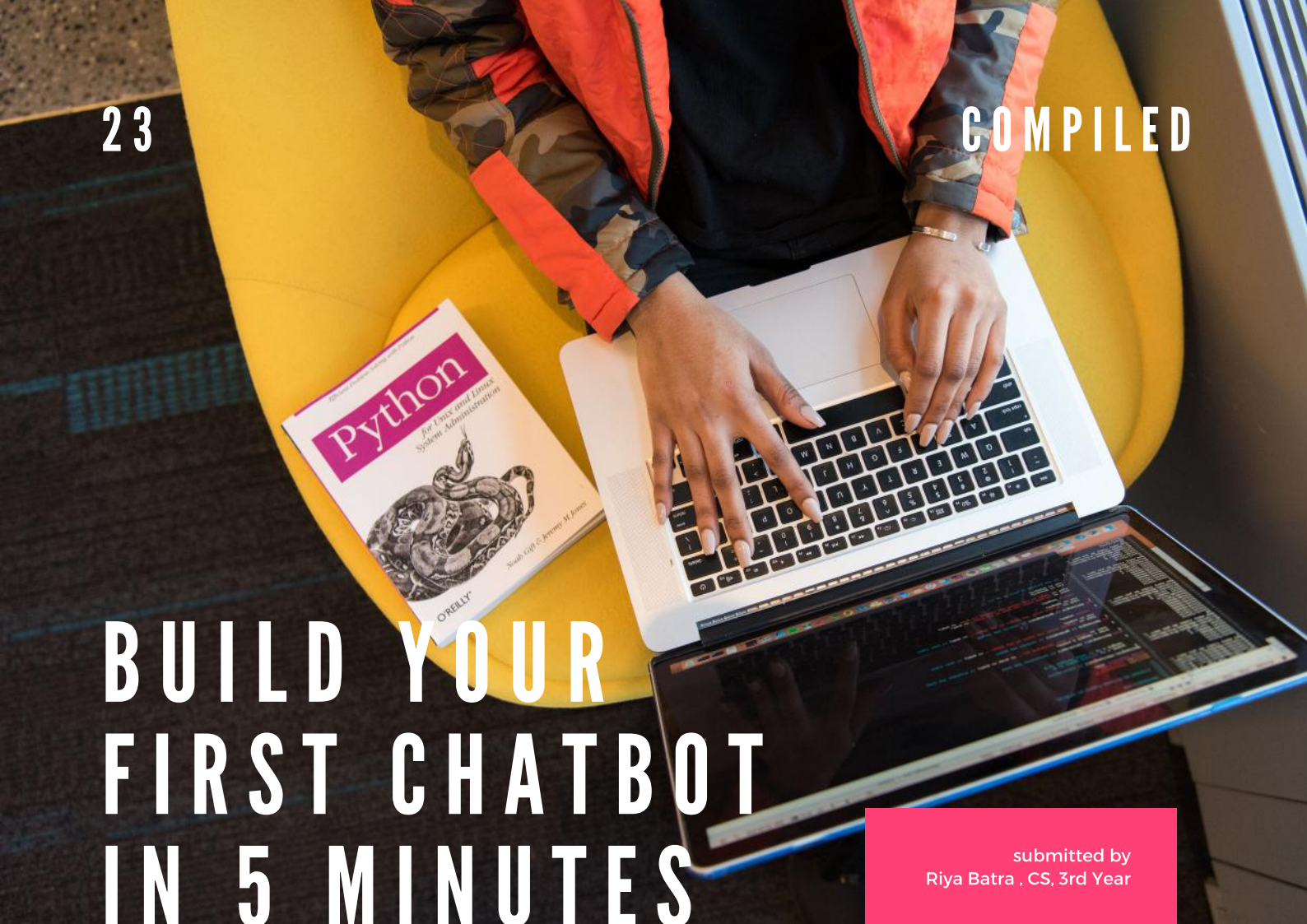


**Tech Stack**  
**Unity - Vuforia**

**FIRST PLACE**  
**TECHVISION 2017**







# BUILD YOUR FIRST CHATBOT IN 5 MINUTES

submitted by  
Riya Batra , CS, 3rd Year

I was searching the internet on "How to build a Chatbot?" and I discovered ChatterBot which is a machine learning, conversational dialog engine for creating chat bots. In this article we will see how to build a chatbot with ChatterBot in just 5 minutes.

## First Install ChatterBot

```
pip install ChatterBot
```

## Create a file chat.py

```
#import ChatBot  
from chatterbot import ChatBot
```

## Create a new chat bot with the name of your choice

```
bot = ChatBot('Candice')
```

Your bot is created but at this point your bot has no knowledge, for that you have to train it on some data. Also, by default the ChatterBot library will create a sqlite database to build up statements of the chats.

### Train your bot

```
#import ListTrainer
from chatterbot.trainers import ListTrainer

bot.set_trainer(ListTrainer)

# Training
bot.train(['What is your name?', 'My name is Candice'])
bot.train(['Who are you?', 'I am a bot, created by you' ])
```

Your bot is now trained on 2 statements. When you ask your bot "what is your name", it will reply back with "My name is Candice". As you can see it is difficult to train the bot on every single statements. So, we will use ChatterBotCorpusTrainer to train our bot on the large dataset.

```
from chatterbot.trainers import ChatterBotCorpusTrainer
# Create a new trainer for the chatbot
trainer = ChatterBotCorpusTrainer(bot)

# Train the chatbot based on the english corpus
trainer.train("chatterbot.corpus.english")

# Get a response to an input statement
chatbot.get_response("Hello, how are you today?")
```

To run it, Go to terminal. It will train your bot first and then you can start chatting.

```
python chat.py
```

And done! You made your first chatbot in merely 5 minutes!

## Tech Stack

Python - ChatterBot





S P O  
L I G  
H T ;



# WOMEN IN CODING



**SOSWC or Sahyadri Open Source Women's Community is a new initiative to promote and encourage more women into programming to reduce the current gender gap in coding.**

Let us highlight the gender gap present in the tech sector, especially in the software dev area where I come from. Probably you are already familiar with this gap, most likely you can confirm it just by taking a look around you. Nonetheless, the Organisation for Economic Co-operation and Development has published several studies about this gender gap that will help us to understand why it exists and find ways to fight it.



submitted by  
Monisha Tarkar, CS, 3rd Year



Girls Who Code. Women Who Code. Black Girls Code. With the recent proliferation of organizations aiming to attract and educate female developers, you would think that the gender gap in computer science is on its way to closing—slowly, perhaps, but still moving in the right direction. In fact, just the opposite is true, according to a new study by Accenture and Girls Who Code (GWC).

“That was by far the most surprising thing—it’s only getting worse,” says GWC founder and CEO Reshma Saujani. “It feels like today computer science is becoming more popularized and it’s true that the pool is getting bigger, but the share of women has declined.” In 1984, 37% of computer science majors in the U.S. were women. Today, that figure is just 18%. If things continue as is, women will hold only one in five computing jobs in the U.S. by 2025, according to the study, which included a large-scale survey of over 8,000 junior high and high school students, undergraduates, computer science teachers and parents.

With that in mind, a collective of like minded students from Sahyadri College of Engineering joined together under a single umbrella to form **SOSWC - Sahyadri Open Source Women's Community**, a initiative under SOSWC (Sahyadri OpenSource Community) to bring more women into coding and reduce the current gender gap in the tech sector.



SOSWC Hosts events, workshops, hackathons, on trending technologies alongside helping juniors with technical issues and collaborating on different projects.







