

Interstellar and computing science

1- How Cooper did send such a huge amount of quantum data through the watch as morse code in Interstellar?

The logic that was used was that he sent each piece of data, through the watch, using morse code. The second hand in the watch became stuck and effectively continually moved between two seconds in either short or long motions, signifying the dot and dash of morse code. Of course, sending the data would likely have taken a colossal amount of time. But in the tesseract, time was meaningless to Cooper as he had a window into every moment of time in Murph's room. As for Murph, she had a lifetime to decode and understand the data that was being transmitted.

This sketch draws a clock face. Use it to code the dot and dash of morse code with the second hand. You can use the keyboard to choose dot or dash.

```
int code =0;
void setup (){
  size(300,300);
}
void draw() {
  background(200);

  // clock face
  translate(width*.5, height*.5);
  // dessiner le cadran
  stroke(0,0,0);
  strokeWeight(5);
  ellipse(0, 0, width*.9, width*.9);

  // drawing 8 marks
  pushMatrix();

  for(int i = 0; i<360; i+=8) {
    rotate(radians(45));
    line(0, -width*.38, 0, -width*.41);
  }
  popMatrix();

  // drawing hour hand
  pushMatrix();
  strokeWeight(20);
  rotate(radians(hour()*30));
  line(0, 0, 0, -width*.3);

  popMatrix();

  // drawing minute hand
  pushMatrix();
  strokeWeight(10);
  rotate(radians(minute()*6));
  line(0, 0, 0, -width*.35);
  popMatrix();

  // drawing second hand
  pushMatrix();
  strokeWeight(5);
  stroke(255,0,0);
  rotate(radians(second()*6));
  line(0, 0, 0, -width*.4);
  popMatrix();
}

// listening for keyboard events
void keyPressed() {
  if (key == 'a' ) {
    code =1;
  } //dot
  if (key == 'z' ) {
    code =2;
  } // dash
  println("code "+code);
}
```

2- Fake news

Fake news is a neologism often used to refer to fabricated news. This type of news, found in traditional news, social media or fake news websites, has no basis in fact, but is presented as being factually accurate. Claire Wardle of *First Draft News* identifies seven types of fake news:

1. satire or parody ("no intention to cause harm but has potential to fool")
2. false connection ("when headlines, visuals or captions don't support the content")
3. misleading content ("misleading use of information to frame an issue or an individual")
4. false context ("when genuine content is shared with false contextual information")
5. imposter content ("when genuine sources are impersonated" with false, made-up sources)
6. manipulated content ("when genuine information or imagery is manipulated to deceive", as with a "doctored" photo)
7. fabricated content ("new content is 100% false, designed to deceive and do harm")

Present and comment on an example of Fake news (about computing science, physics or chemistry)

3- Computing science and time: How does synchronous and asynchronous communication work?

Explain the major differences between Synchronous and Asynchronous Transmission. Use examples (networks, personal computer, processor) to reach this goal.