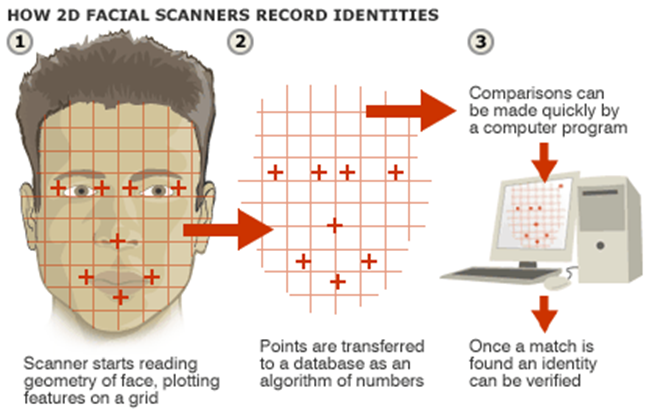
**logo-medWorkshop #5: Biometrics and Speech Recognition**

*Biometrics* is the science relating to the automatic recognition of people based on biological and behavioral characteristics – for example, fingerprints, iris/retinal scans, faces or voices. We see this a lot in TV shows like CSI and movies like Gattaca, but it is increasingly becoming part of our everyday lives:

* Disney World fingerprints you when you enter.
* In 2002, researchers estimated that there were 500,000 closed circuit cameras watching people in London.
* In many airports (US, Canada, Netherlands, …), you can speed through customs by getting an iris scan.

But what makes this computer science? Biometrics is closely related to *machine learning*, a field at the intersection of computer science, statistics and math. The goal of machine learning is to sift through large amounts of data to recognize patterns. Machine learning is used in many applications and fields of computer science: intrusion detection (network security); machine translation (NLP); robotics; computer vision; bioinformatics; and financial engineering, to name a few.

Humans can easily recognize faces; computers cannot. But if we have millions of examples of pairs of faces that are the same person and pairs that are not, the machine learning algorithm can try to extract features from the faces that can help it decide whether two faces match or not.



Biometrics is one of the few upper-level CS courses that does not have a lot of prerequisites (just “a background at the sophomore level in computer science, engineering, or like discipline.”)

<http://news.bbc.co.uk/nol/shared/spl/hi/guides/456900/456993/img/noflash/facial_scan_416_dc.gif>

### Related Columbia Classes

Core classes:

* COMS W3203 Discrete Mathematics
* COMS W3261 Computer Science Theory

Advanced classes:

* COMS 4737 Biometrics
* COMS W4701 Artificial Intelligence
* COMS W4252 Introduction to Computational Learning Theory
* COMS W4771 Machine Learning