Machine Learning

Goal of this course
A broad view of Machine Learning

Overlaps in Course Material

CS539

DS3001

CS4445
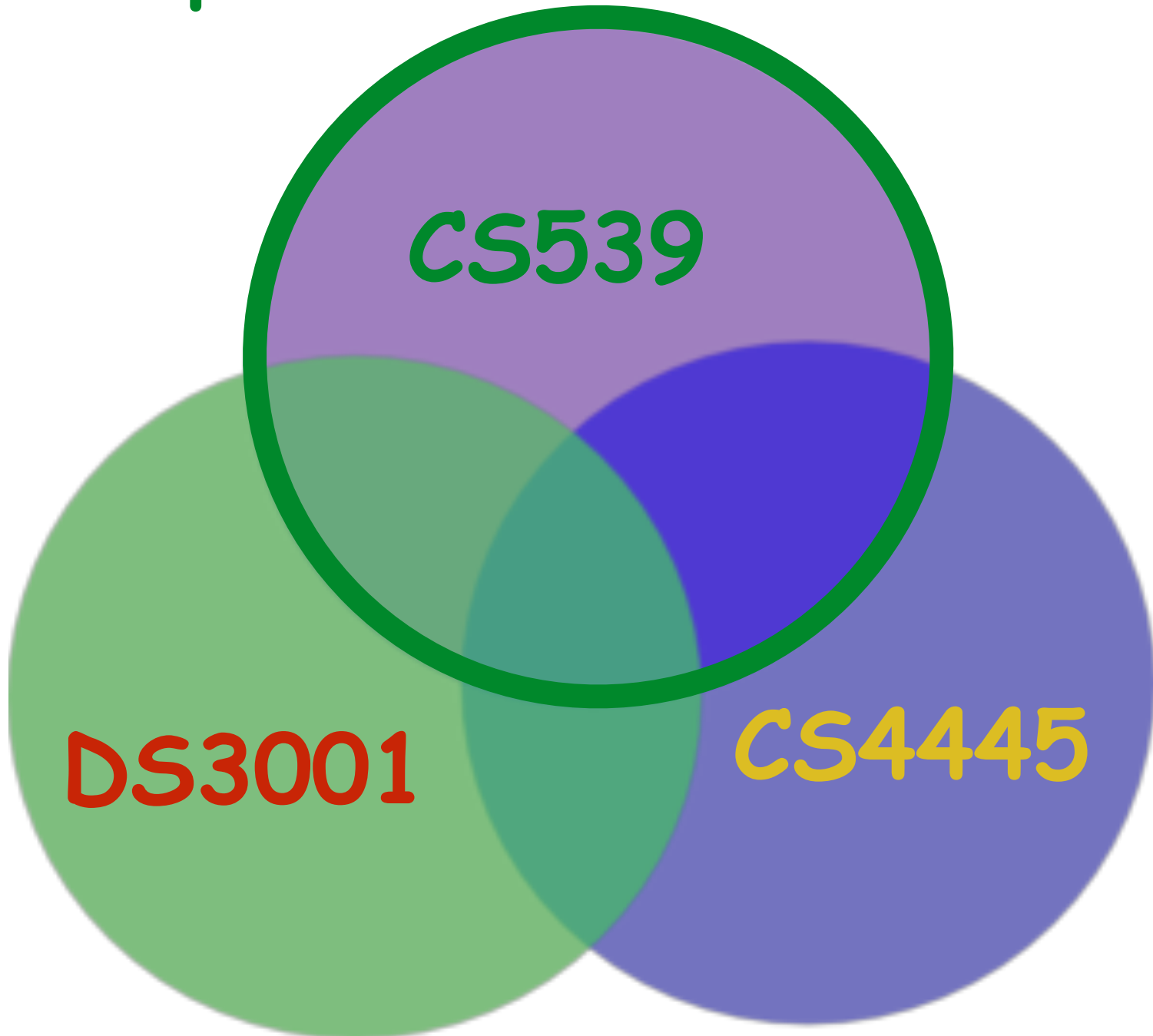
Gear up in the era of Big Data

Math + Tools

- Be comfortable with both

Official Programming Language

Scores

- Homework Assignments: 78%

- Quizzes: 22%

Homework (6X13%=78%)

- 7 Homework Assignments

- the lowest homework score will be dropped

- Need Python 3

- Homework 1 is released TODAY

- The Due is Jan 24, BEFORE the class (not midnight)

Daily Quizzes
(22 X 1% = 22%)

- 26 Quizzes

- 4 lowest quiz scores will be dropped

- No exam

Course Calendar

Due Dates: homework

Course Summary:

Date	Details	
Thu Jan 11, 2018	📅 Lecture 1	4pm to 5:20pm
Tue Jan 16, 2018	📅 Lecture 2	4pm to 5:20pm
	📝 Quiz 1	due by 4:10pm
Thu Jan 18, 2018	📅 Lecture 3	4pm to 5:20pm
	📝 Quiz 2	due by 4:10pm
Tue Jan 23, 2018	📅 Lecture 4	4pm to 5:20pm
	📝 HW 1 (SVM)	due by 4pm
	📝 Quiz 3	due by 4:10pm
Thu Jan 25, 2018	📅 Lecture 5	4pm to 5:20pm
	📝 Quiz 4	due by 4:10pm
Tue Jan 30, 2018	📅 Lecture 6	4pm to 5:20pm
Thu Feb 1, 2018	📅 Lecture 7	4pm to 5:20pm

A Problem

```python
LOdegree = np.zeros(len(A))

columnTot = A.sum(axis=0)

for i in range(0, len(A)):
    LOdegree[i] = columnTot[0, i]

diagonal = A.diagonal()
d = diagonal.flat
dm = list(d)
D = np.mat(np.diag(LOdegree - dm))
```

```python
degree = np.zeros(len(A))

colsum = A.sum(axis=0)
# rowsum = A.sum(axis=1)

for j in range(0, len(A)):
    degree[j] = colsum[0, j]   #might nee

diag = A.diagonal()
d = diag.flat
diagMat = list(d)

D = np.mat(np.diag(degree - diagMat))
```

- An example of two students copying/ sharing homework solutions

Common Causes

- I was too busy recently, I need to prepare for a job interview (why not using the dropped assignment)

- I am not familiar with Python programming (or math), and spend many hours not being able to solve the problem. (should drop the course)

- My best friend asked me to help. I cannot lose a friend for not sharing my code. (sharing code is not helping)

- I was traveling last week and cannot solve the problem in the last hour before the due. (start early)

Why Important

- I can certainly give everyone an A without any requirement, but it won't give everyone a job.

- The key is how much we learn, not the grade

  ❖ *Almost half* of students reported that they had worked with one or more students on a homework assignment when not allowed to do so.

  ❖ *One quarter* of students reported feeling indifferent when they witnessed cheating and "feel that reporting a friend who is cheating" is as bad as, or worse than, cheating.

  ❖ *Two thirds* of students believe that "collaboration on individual assignments" is not academic dishonesty.

The most common forms of academic dishonesty are:

1. Working on assignments in groups when prohibited to do so.
2. Copying assignments, homework, or computer programs from another student.

- **Cheating:** Using or attempting to use unauthorized materials, information, or study aids in any academic exercise.
  Examples include, but are not limited to:
  - Using and submitting purchased papers

  - Using unauthorized materials or sources of information, such as a cheat sheet, preprogrammed calculator, etc.

  - Copying another student's academic work

  - Unauthorized communication during an examination

- **Fabrication:** Falsification, misrepresentation, or the invention of any information, data, or citation in an academic exercise.
  Examples include, but are not limited to:
  - Inventing or changing laboratory data and/or research

  - Altering grades or other official records

  - Citing a source in a bibliography that was not used

  - Changing exam solutions after the fact

- **Facilitation:** Helping or attempting to help another to commit an act of academic dishonesty.
  Examples include, but are not limited to:
  - Sharing test questions or answers from an exam, homework or lab with another student

  - Doing any academic work for another student, such as homework or tests

  - Allowing another student to copy a solution to a homework problem, exam or lab

  - Making available previously used academic work for another individual who intends to resubmit the work for credit

  - Assisting in any act of academic dishonesty of another student

- **Plagiarism:** Using as one's own the words, ideas, data, code, or other original academic material of another without providing proper citation or attribution. Plagiarism can apply to any assignment, including final or drafted copies.
  Examples include, but are not limited to:
  - Misrepresenting the work of another as one's own

https://www.wpi.edu/about/policies/academic-integrity/dishonesty

Professor suspects student of academic dishonesty

Professor confers with Department Head

Checks with Dean of Students for previous record

Previous record

No record

optional

CAMPUS HEARING BOARD

Student does not admit

Meet with student

Student admits and accepts sanctions

Faculty/Student sign

Copy of agreement sent to Dean of Students

CASE CLOSED

Student found not responsible

CASE CLOSED

Student found responsible

Decision and sanction letter sent

Student does not appeal

CASE CLOSED

Student appeals

PRESIDENTIAL BOARD OF APPEALS

CHB decision upheld

CASE CLOSED

CHB decision modified

CHB decision reversed

Sanction modified

CASE CLOSED

Case remanded to CHB for re-hearing

Dr. Kong,

I finished all the grades for HW 3. I haven't posted them yet because I have a couple of questions and issues.

...

I ran into something I felt I should bring to your attention. I noticed that some codes submitted between students were very similar to each other's. I noticed that students ████████████████████████████████████ had very similar codes (I put them in a folder called *Group 1*-*SimilarCodes.zip*). Also I noticed that ██████████████ had very similar codes(*Group* *2-SimilarCodes.zip)*.

Report an issue in ████████

Xiangnan Kong <xkong@wpi.edu>
to Craig ▾

Good morning, Craig!

My TA reported that █ students ██████████████ in my class are submitting almost identical homework submissions

Checking student (if any) prior record for academic dishonesty

Xiangnan Kong <xkong@wpi.edu>
to dean-of-students ▾

Good morning!

I am the instructor for ██████████████, and I need to report an issue of academic dishonesty in my class invo

Academic Dishonesty Departmental Agreement Form

DEPARTMENT NAME:

STUDENT NAME: **STUDENT ID:**

COURSE NAME/NUMBER:

DATE OF VIOLATION: **TERM:** A ☐ B ☐ C ☐ D ☐ E ☐

This agreement is to inform the Dean of Students Office that the above named student has committed a violation of the WPI Academic Honesty Policy. **CHARGE(S):** Cheating
DESCRIPTION OF VIOLATION:

SANCTION IMPOSED:

I have informed the student that he/she has the right to plead not responsible to the charge of academic dishonesty and to exercise his/her right to have the case heard by the Campus Hearing Board (CHB). I have also informed the student that by signing this agreement, he/she accepts responsibility for the charge, waives his/her right to bring this matter to the Campus Hearing Board, and agrees to resolve this matter as indicated above.

In addition, I have informed the student that a copy of this agreement will be kept on file in the Dean of Students Office, and per the WPI Academic Honesty Policy, **any second or subsequent violations are automatically forwarded to the CHB for resolution. Judicial sanctions imposed by the CHB may include disciplinary suspension or expulsion from WPI.** *The student is encouraged to meet with a Research & Instruction Librarian at WPI's Gordon Library, and with a tutor at the WPI Writing Center, to learn more about plagiarism and properly incorporating and crediting sources.*

Disciplinary records for any act of academic dishonesty are retained in the Dean of Students Office, and are reportable for two years from the date of graduation or withdrawal from WPI, except when the sanction includes suspension or expulsion. In cases resulting in suspension or expulsion from WPI, disciplinary records shall be kept in perpetuity. Disciplinary records may be shared internally (e.g. Project Center, Honor Societies, etc.) or externally (e.g. Graduate School, employer, etc.) only with the written permission from the student.

If the student does not wish to sign this agreement or if he/she has questions about the WPI judicial process, he/she is encouraged to contact the Dean of Students Office to discuss the options available for resolution. The Dean of Students Office is located in the Rubin Campus Center, Room 226, 508-831-5201, dean-of-students@wpi.edu.

What is
Machine Learning?

The goal of the field of machine learning is to build computer systems that learn from experience and that are capable to adapt to their environments.
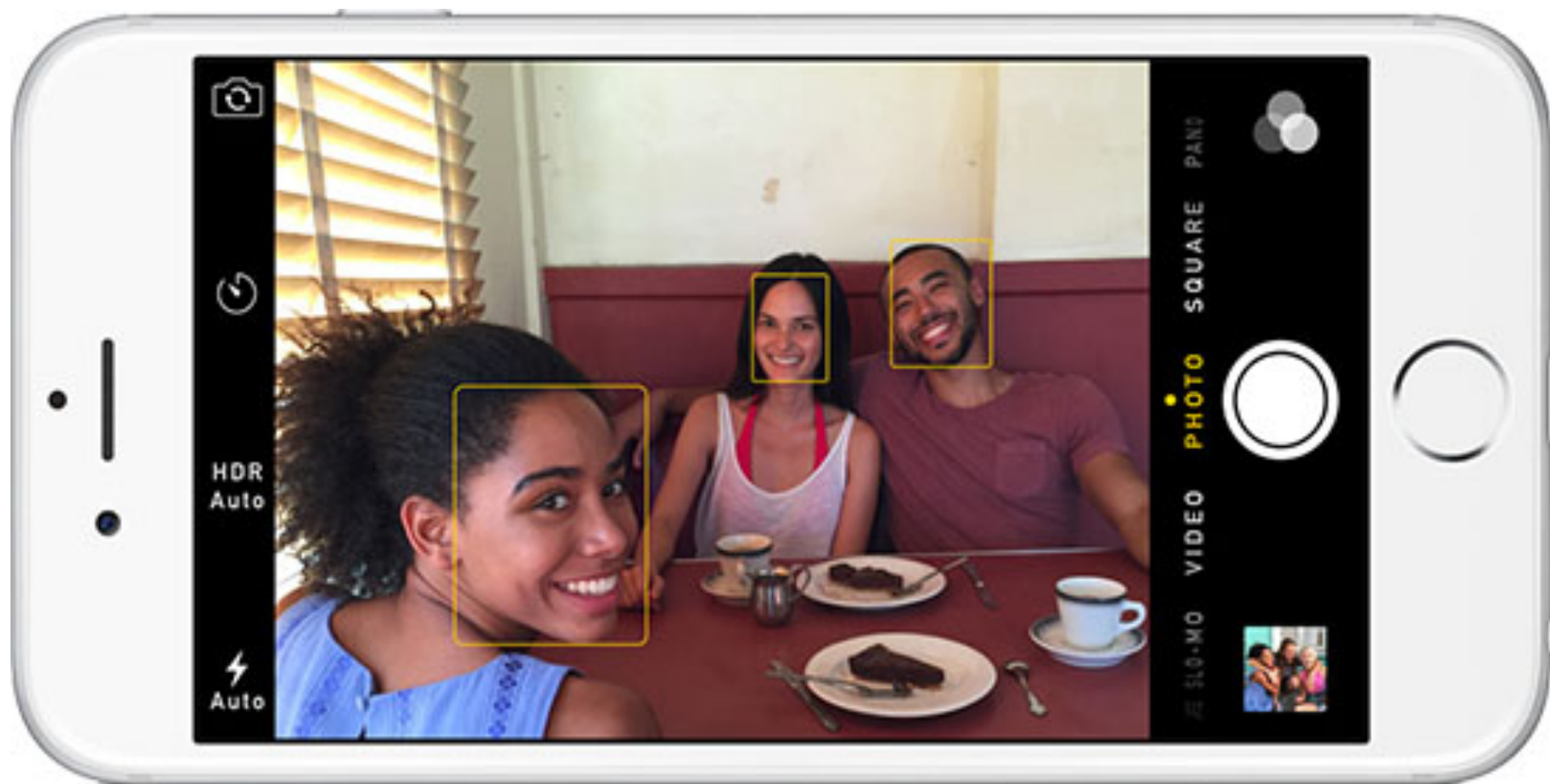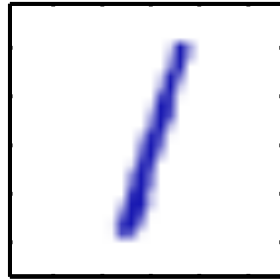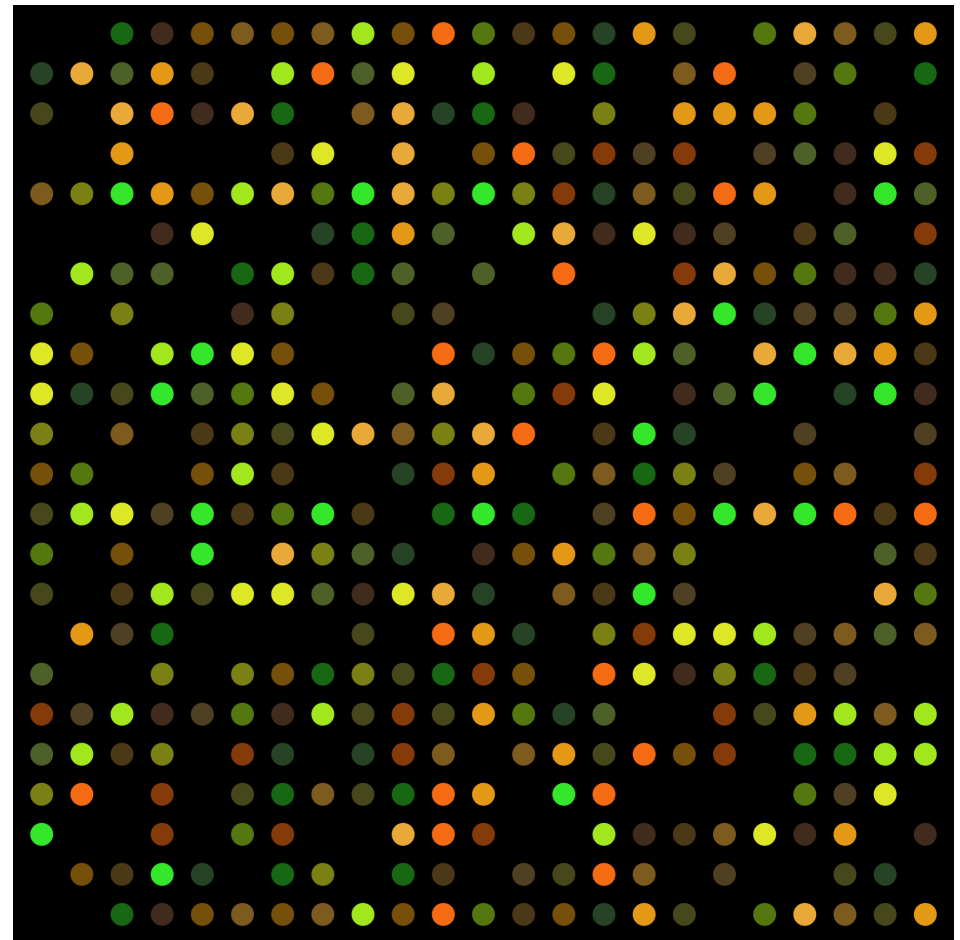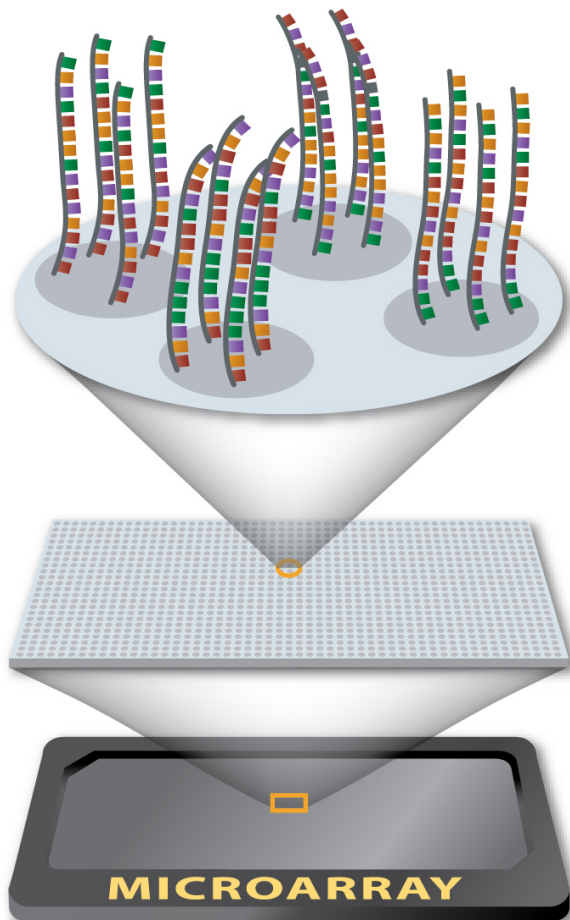
hand-written digit recognition

Cancer Detection

AlphaGO