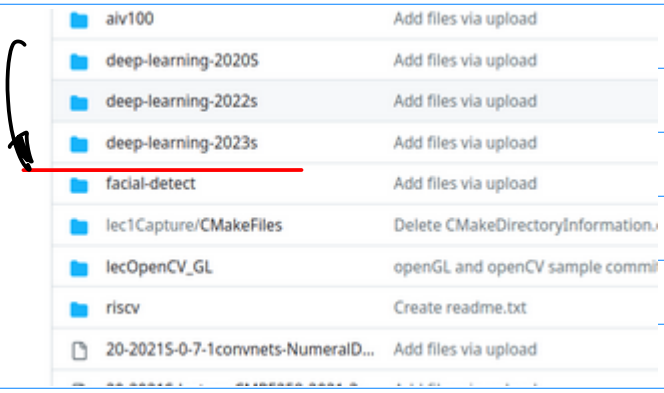
CMPE258
Fall 2023

August 22 (Tue)
Organizational meeting.
1. Class Material on github
github/hualili



Course and Contact Information

Instructor(s): Harry Li
Office Location: Engineering Building, Room 267A
Telephone: (650) 400-1116 for text messaging only
Email: hua.li@sjsu.edu
Office Hours: M.W. 3:00-4:00 pm
IN-Person.
Class Days/Time: Tuesdays and Thursdays 4:30-5:45 pm.
Classroom: Engineering Building Room 337
Prerequisites: CMPE 255 or CMPE 257 or instructor consent. Computer Engine
Engineering majors only.

Course Description

2. Prerequisites Requirements
Bring your Proof to the next Class.

3. Emphasis on "Deep Neural Networks", & Semantic Segmentation

Course Description

Deep neural networks and their applications to various problems, e.g., speech recognition, image segmentation, detection and recognition of temporal and spatial patterns, and natural language processing. Covers underlying theory, the range of applications to which it has been applied, and learning from very large data sets.

Note: Definition (AI): (Human Intelligence)
is Symbolic Representation of
Learnt Experience.

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4. Projects. 2 pjts | team project (Semester Long) } ~~30%~~ 25% ~~30 pts~~

5. In-Person Class; CANVAS is utilized to post Homework/Project Requirements, and to collect the submission of the Homework, as well as for the exams.

NO

This course is an online course. The students must have Internet connectivity and Zoo
his/her machine. The students must participate in the class activities and submit all ass
exams to SJSU CANVAS. The syllabus, faculty contact information on the syllabus,
projects, and exam papers are all available on CANVAS. See University Policy F13-2

6.

Grading Information

Quiz, Homework, Projects	30%
Midterm Examination	30%
Final Examination	40%

Note:
1° CANVAS To Be up by the end of the day, Friday;
2° Tools & Software To be installed (will provide "Readme" as Ref)
OpenCV
Python.
T.F. Version 2.0 or higher

7. Textbooks & References

Textbook

- Deep Learning with Python, 1st or 2nd Edition, by François Chollet, ISI
ISBN-10: 9781617294433, https://github.com/hualili/opencv/blob/mast
2018F-6-DeepLearningCh02.pdf
- Robot Vision by B.K. P. Horn, the MIT press, ISBN 0-262-08159-8, c
Hill).
- Reference textbook Learning OpenCV, Computer Vision with the Ope
Kaebler, O'Reilly Publisher, ISBN 978-0-596-51613-0, 2011.

Today's Topic:
Intro. to Deep Convolutional Neural Networks.

Ref: github.
2022F-103-NN-Intro-Python-v5-2022-8-25

Note: Lab Space for the class Rm268.

8. Software Tools & Dev. Environment

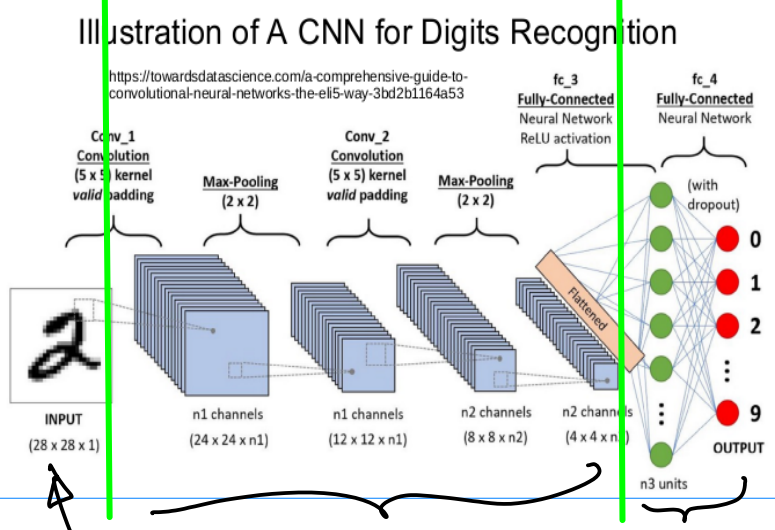
Python. Pycharm.
Anaconda.
TensorFlow.

Note: Rm268 Available ~~Per~~ ON Approved Basis.

August 24 (Thursday)

Example: Architecture Overview.

Note 1.

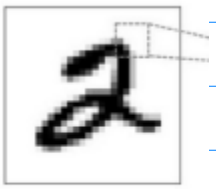


Preprocessing Computer Vision.

Convolution Layers
Feature Extraction
To produce Feature Vectors.
$\vec{u} = (u_1, u_2, \cdots, u_N)$

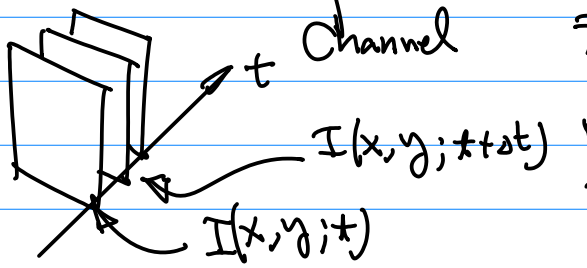
Feed Forward Neural Networks.
Decision Making

2. Image Definition



$I(x, y; t)$

Note: for x & y definition see Ref. Next page.



M x N
No. of col. Per Row.
No. of Rows per frame

Ref: on the github.

2023S-101-Note-cmpe258-2023-03-16.pdf

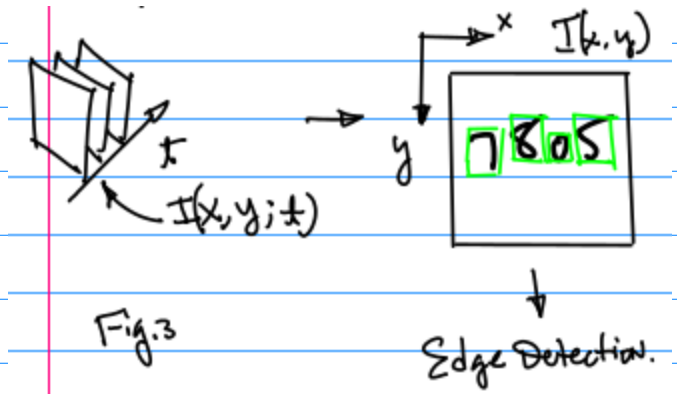


Fig.3

Comparison to Web Cam.

1080p Resolution: 1920x1080

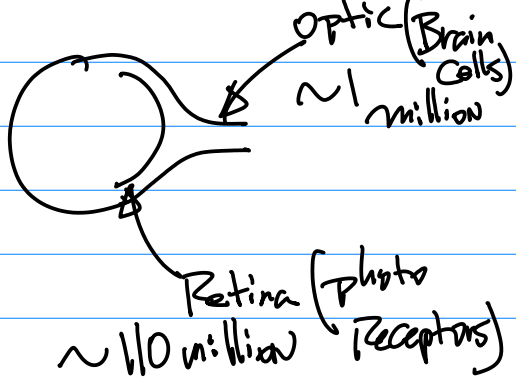
$\sim 2^{11} = 2 \cdot 2^{10} = 2K$

$\sim 2^{11}$

$2^{22} = 2^2 \cdot 2^{20}$

$= 4$ Meg

$\simeq 4$ million.



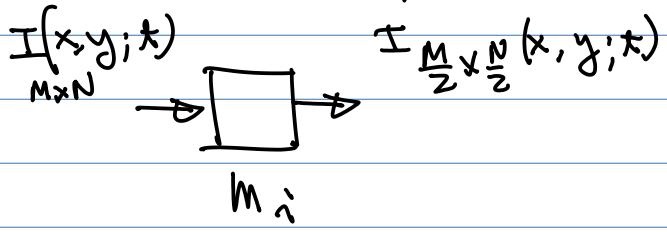
3. For the Convolutional Lay., we denote it as C_i, where $i = 1, 2, \cdots, N$

for Max Pooling Layer, we denote it as M_j, where $j = 1, 2, \cdots, K$

So, for the example, we have

$C_1 M_1 \rightarrow C_2 M_2$

Max pooling for Resolution Reduction / Feature Reduction.



Note: BioLogic Inspiration, Human Visual Perception System, Retina, ~110 million photo Receptors

4. At the 3rd segment (Blocks) of the Architecture, we denote Feed Forward Neural Networks as F_M

No. of Neurons / Nodes

for example, F_{10} (10 Nodes) for the output Layer.