



2022 年广东省一类品牌专业建设项目验收佐证材料



5.1.2 关键任务完成情况表之 学习和引进境外体系标准和教学资源

(智能光电技术应用专业)

中山火炬职业技术学院

2022 年 4 月



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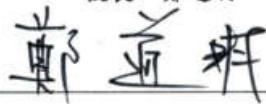
朝陽科技大學與中山火炬職業技術學院 建立長期學術合作關係備忘錄

朝陽科技大學與中山火炬職業技術學院為促進雙方的學術與合作，經過友好協商，達成以下具體內容：

- 一、雙方可組團互訪，就拓展學術交流與合作的領域及具體項目等問題進行磋商。
- 二、經雙方商議，安排教師到對方學校進行學術訪問和短期講學等交流活動。
- 三、雙方將有計畫地研展各種合作研究，並共同承辦有關學術研討活動。
- 四、雙方互贈各自編輯出版的學術期刊及相關資料。
- 五、雙方在各自主(承)辦有關學術會議時，將有關資訊通知對方，如對方有意參加，則安排其出(列)席。
- 六、雙方互派教師至對方學校講學，有關課程、人數及時間根據實際需要另訂之。
- 七、積極創造條件，互派學生至對方學校交流研修。人數、專業及研修費用由雙方商定。
- 八、雙方合作期間自簽約日起三年止。其中一方若欲終止本合作備忘錄關係時，應以書面告知對方，以對方收到終止合作通知書之一個月後，正式終止合作關係。
- 九、本備忘錄乙式二份，雙方各執乙份，自簽字之日起生效；備忘錄到期時，雙方仍有意願合作，可另行簽署延長本合作關係備忘錄三年。

朝陽科技大學

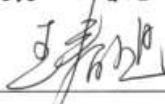
校長 鄭道明



年 月 日

中山火炬職業技術學院

校長 王春旭



年 月 日

龙华科技大学和中山火炬职业技术学院 合作交流备忘录

龙华科技大学和中山火炬职业技术学院，商定建立和发展两校交流合作关系，并达成如下学术合作交流事项：

一、学术交流与科研合作：

联合举办研讨会、学术讲座和交流活动等；在共同感兴趣的领域内进行科研合作，成果共享。

二、教师交流合作：

鼓励和安排教师到对方学校客座讲学、研究或进修。

三、学生交流合作与联合培养：

开展学生互换、夏（冬）令营等交流合作活动；开发联合培养的管道。

四、双方指定各自分管部门和一名协调人，负责上述合作交流活动的管理和开展。

上述备忘录每一条款由双方另行制定实施细则，并根据具体实施细则进行。此合作交流备忘录，在双方代表签字后生效，有效期三年，届满自动更新，任何一方如欲解约，应于六个月前以书面通知对方。

龙华科技大学

校长

年 月 日

中山火炬职业技术学院

校长

年 月 日

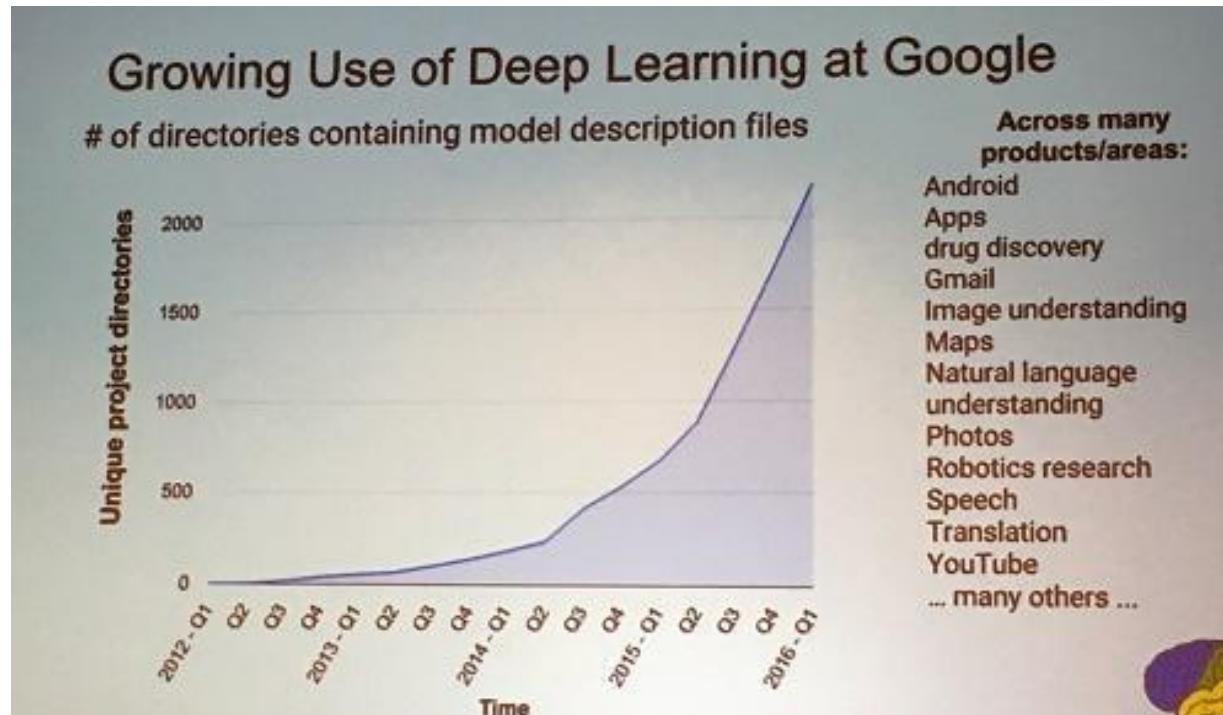
Deep Learning

Hung-yi Lee

李宏毅

Deep learning attracts lots of attention.

- I believe you have seen lots of exciting results before.



Deep learning trends at Google. Source: SIGMOD 2016/Jeff Dean

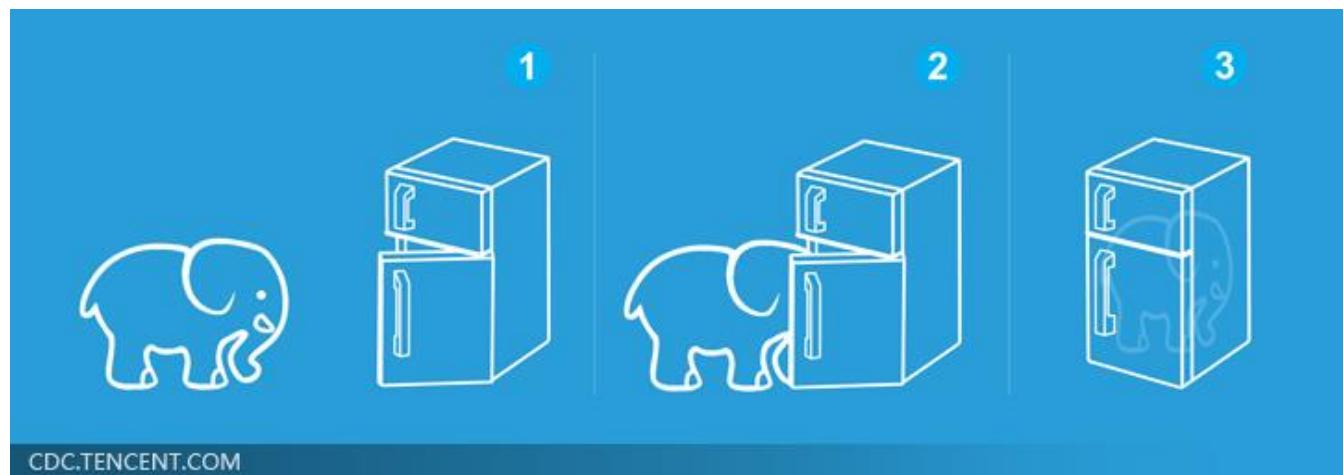
Ups and downs of Deep Learning

- 1958: Perceptron (linear model)
- 1969: Perceptron has limitation
- 1980s: Multi-layer perceptron
 - Do not have significant difference from DNN today
- 1986: Backpropagation
 - Usually more than 3 hidden layers is not helpful
- 1989: 1 hidden layer is “good enough”, why deep?
- 2006: RBM initialization
- 2009: GPU
- 2011: Start to be popular in speech recognition
- 2012: win ILSVRC image competition
- 2015.2: Image recognition surpassing human-level performance
- 2016.3: Alpha GO beats Lee Sedol
- 2016.10: Speech recognition system as good as humans

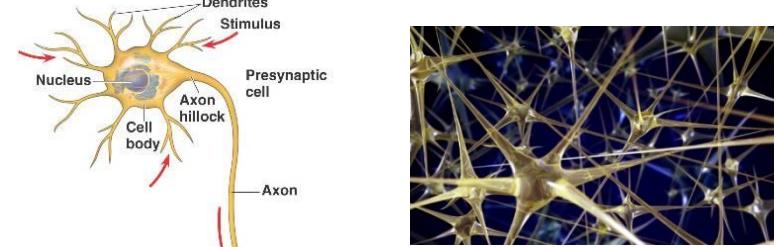
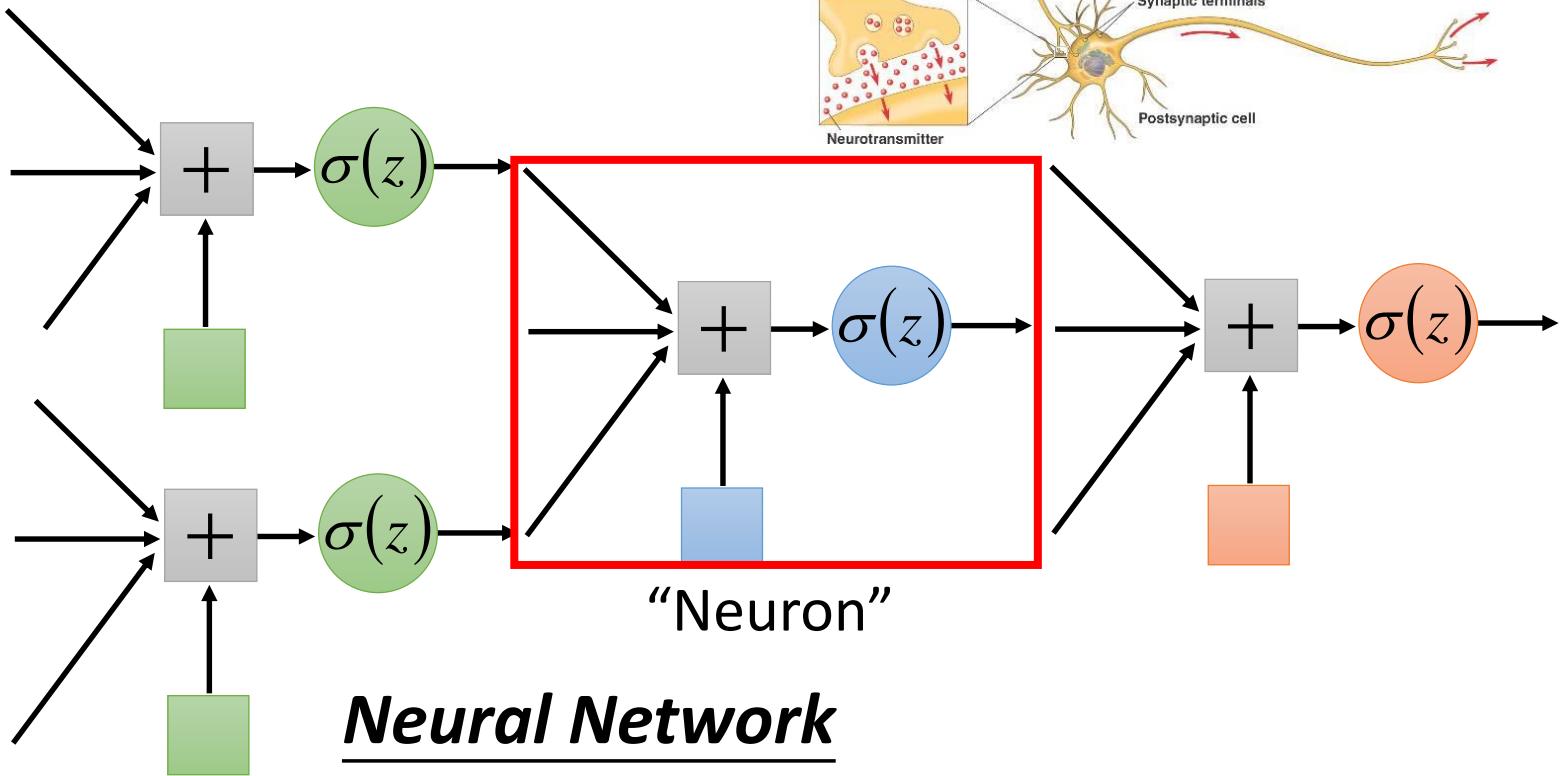
Three Steps for Deep Learning



Deep Learning is so simple



Neural Network

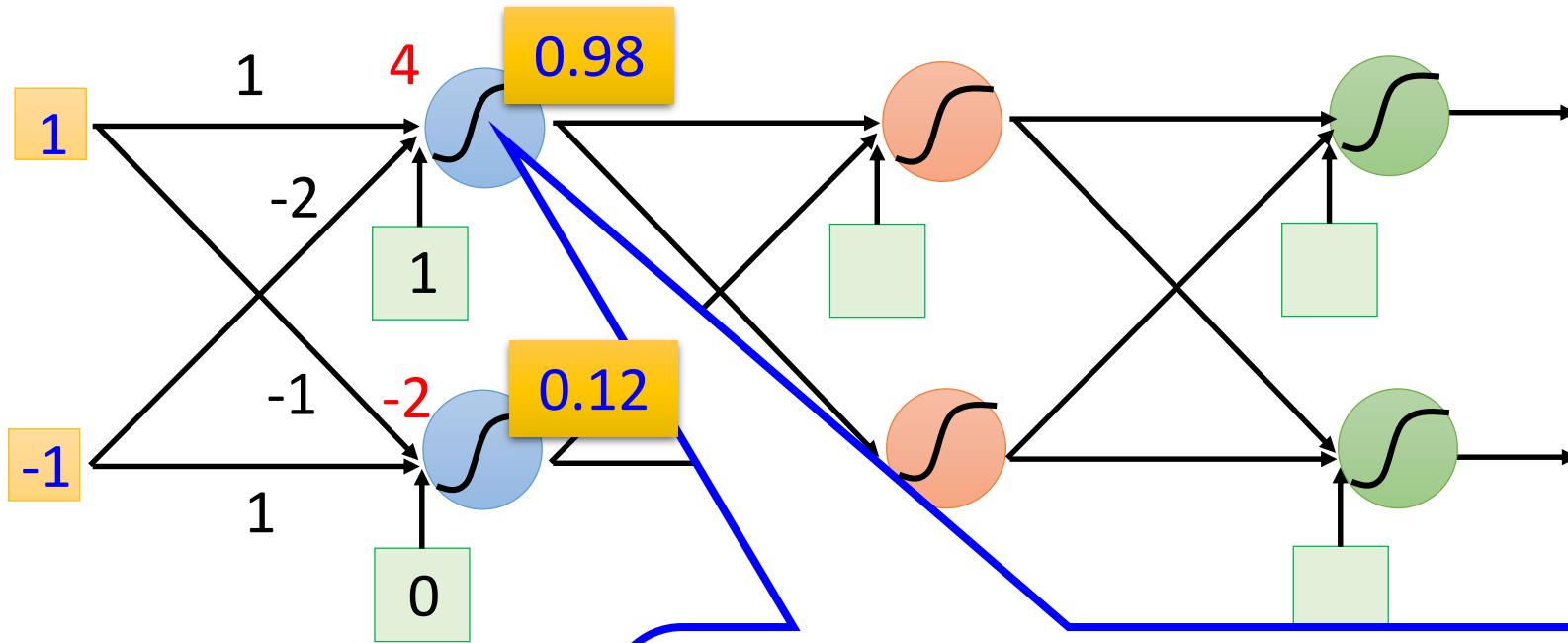


Neural Network

Different connection leads to different network structures

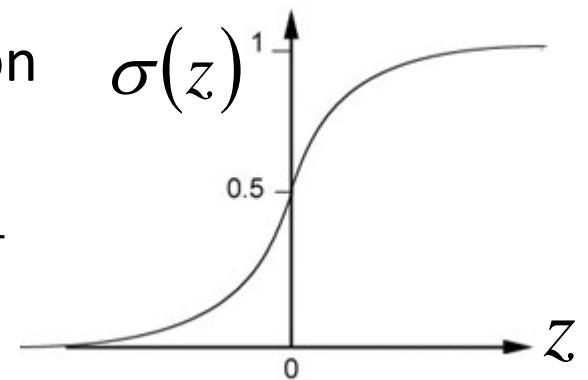
Network parameter θ : all the weights and biases in the “neurons”

Fully Connect Feedforward Network

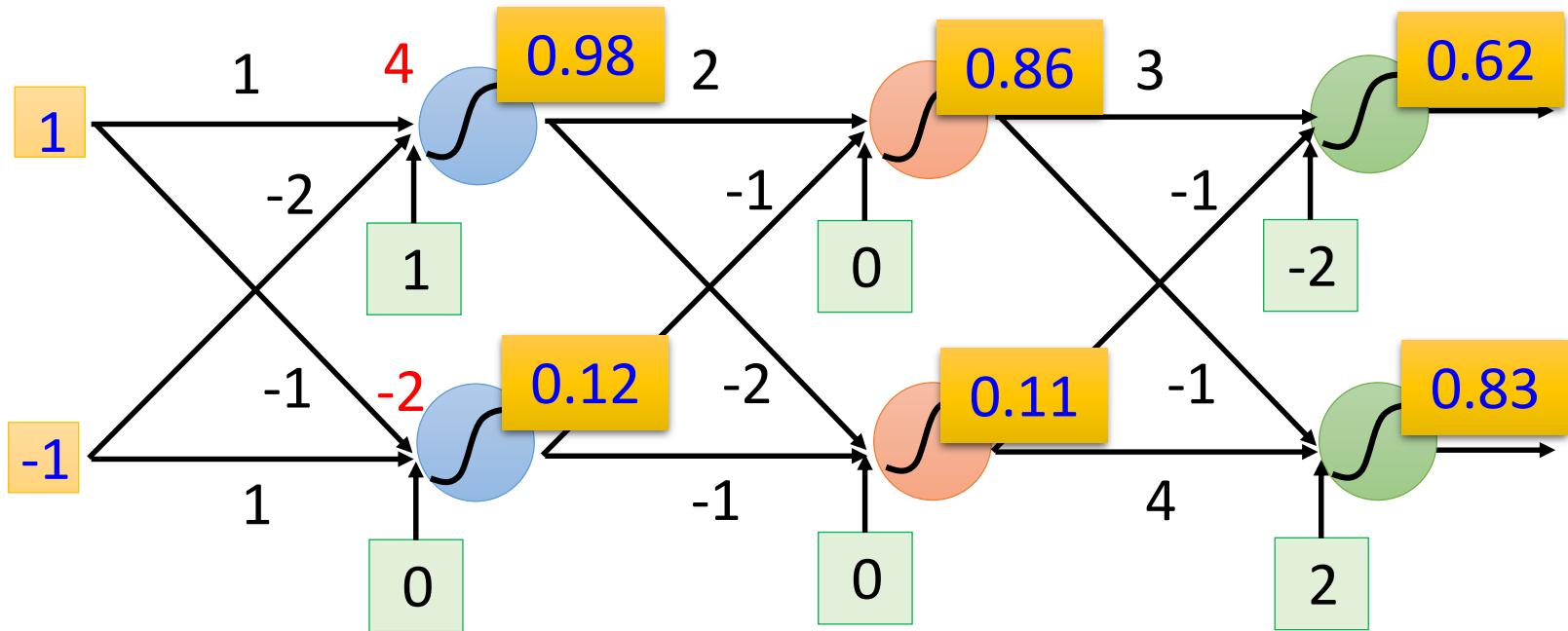


Sigmoid Function

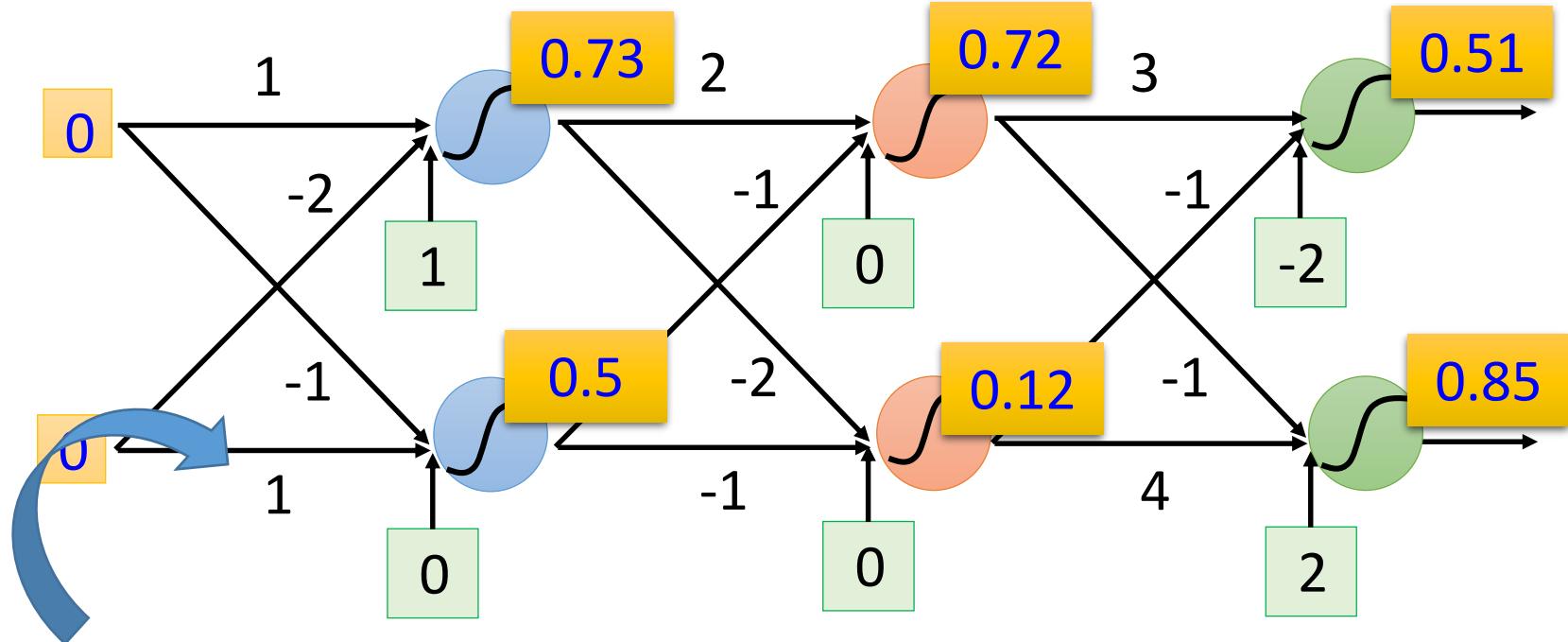
$$\sigma(z) = \frac{1}{1 + e^{-z}}$$



Fully Connect Feedforward Network



Fully Connect Feedforward Network

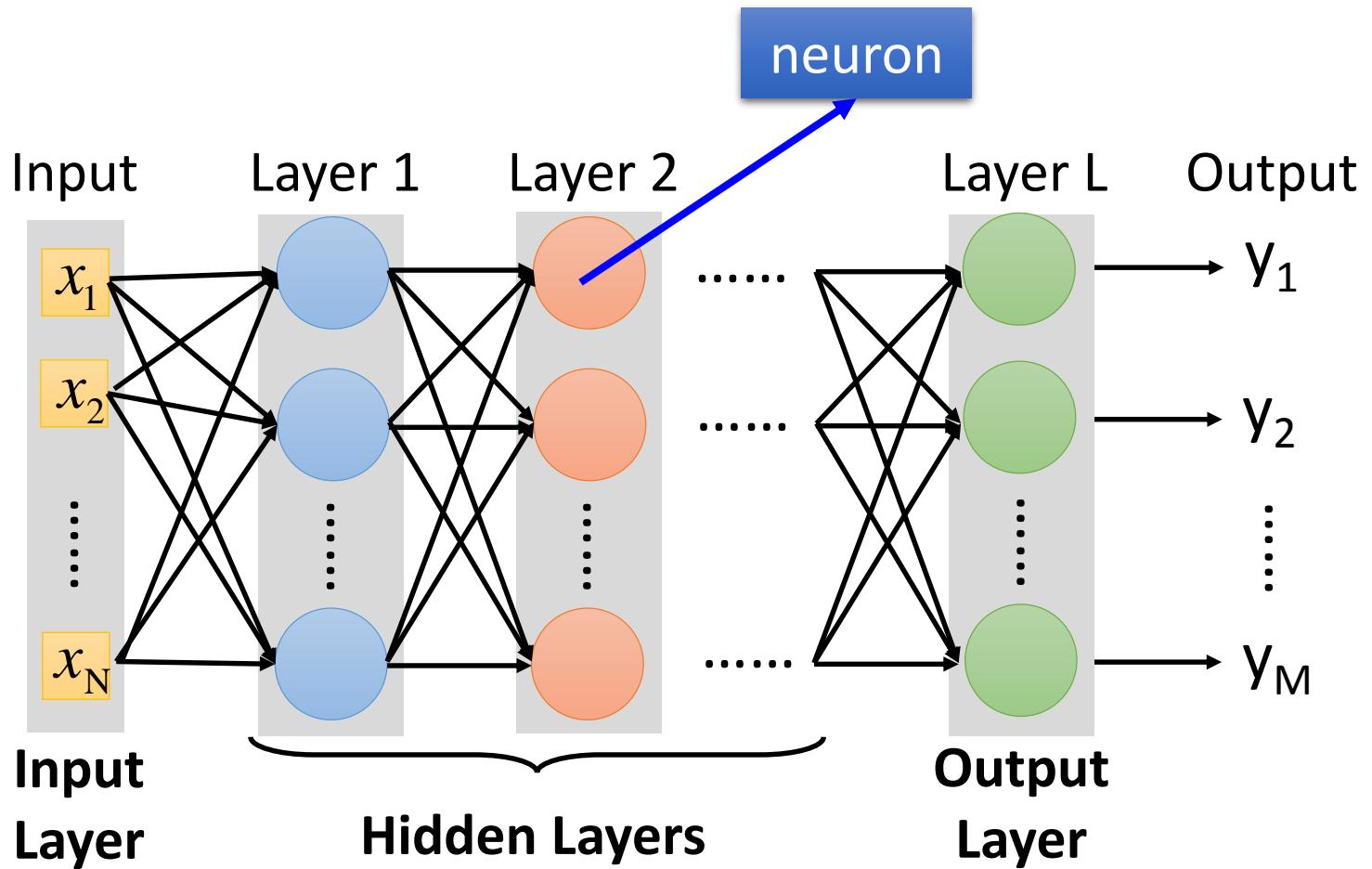


This is a function.
Input vector, output vector

$$f\left(\begin{bmatrix} 1 \\ -1 \end{bmatrix}\right) = \begin{bmatrix} 0.62 \\ 0.83 \end{bmatrix} \quad f\left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}\right) = \begin{bmatrix} 0.51 \\ 0.85 \end{bmatrix}$$

Given network structure, define a function set

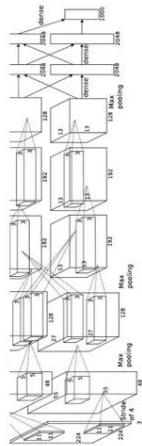
Fully Connect Feedforward Network



Deep = Many hidden layers

http://cs231n.stanford.edu/slides/winter1516_lecuture8.pdf

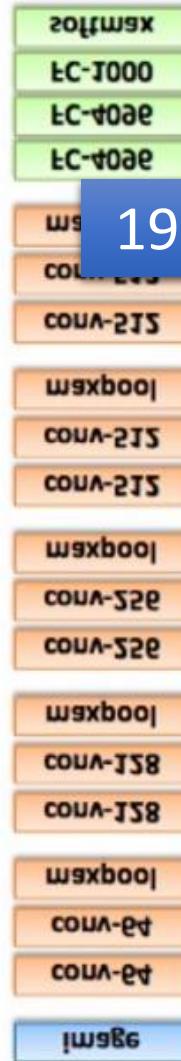
16.4%



AlexNet (2012)

8 layers

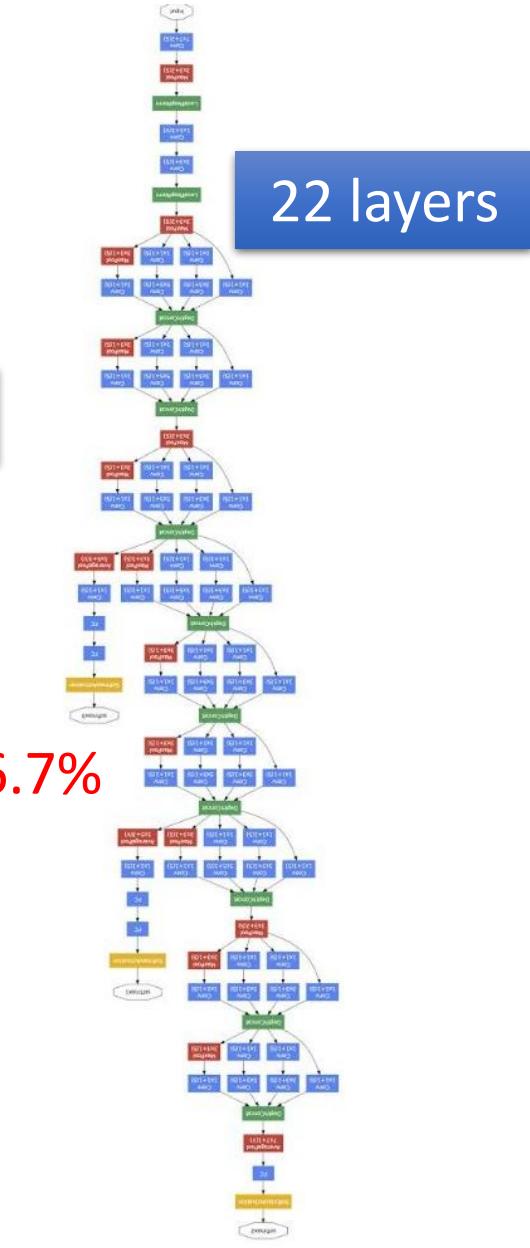
7.3%



VGG (2014)

19 layers

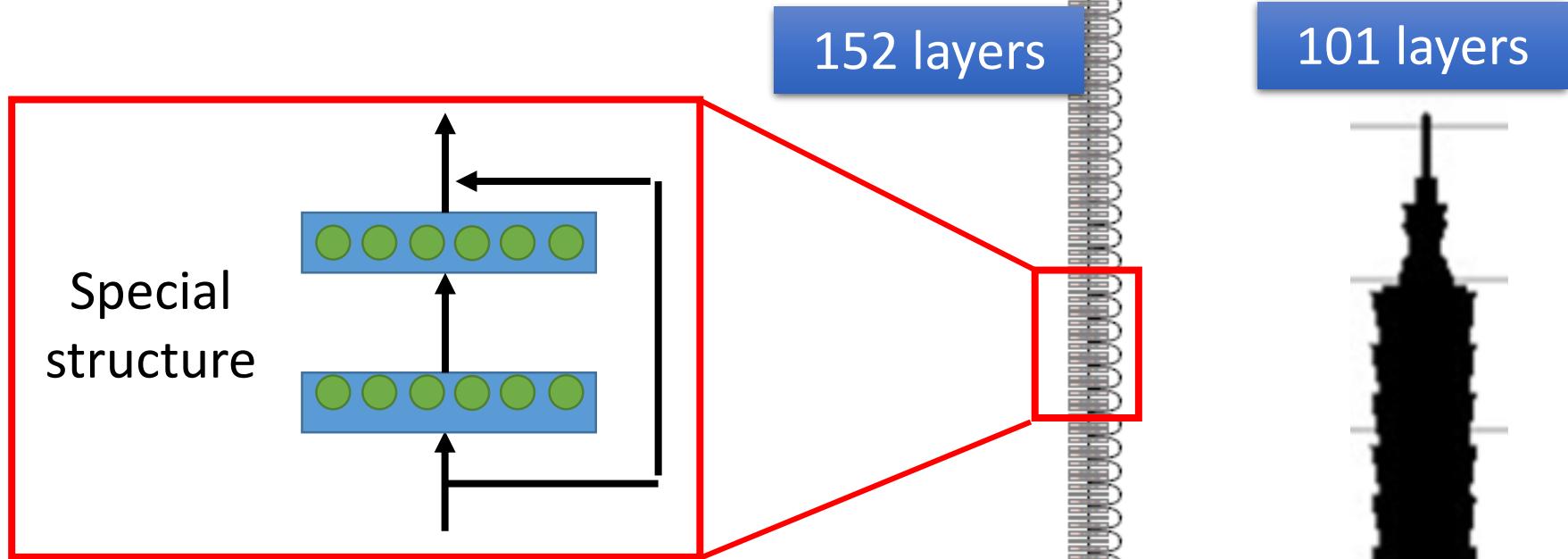
6.7%



GoogleNet (2014)

22 layers

Deep = Many hidden layers



Ref:

<https://www.youtube.com/watch?v=dxB6299gpvl>

3.57%

16.4%

7.3%

6.7%

AlexNet
(2012)

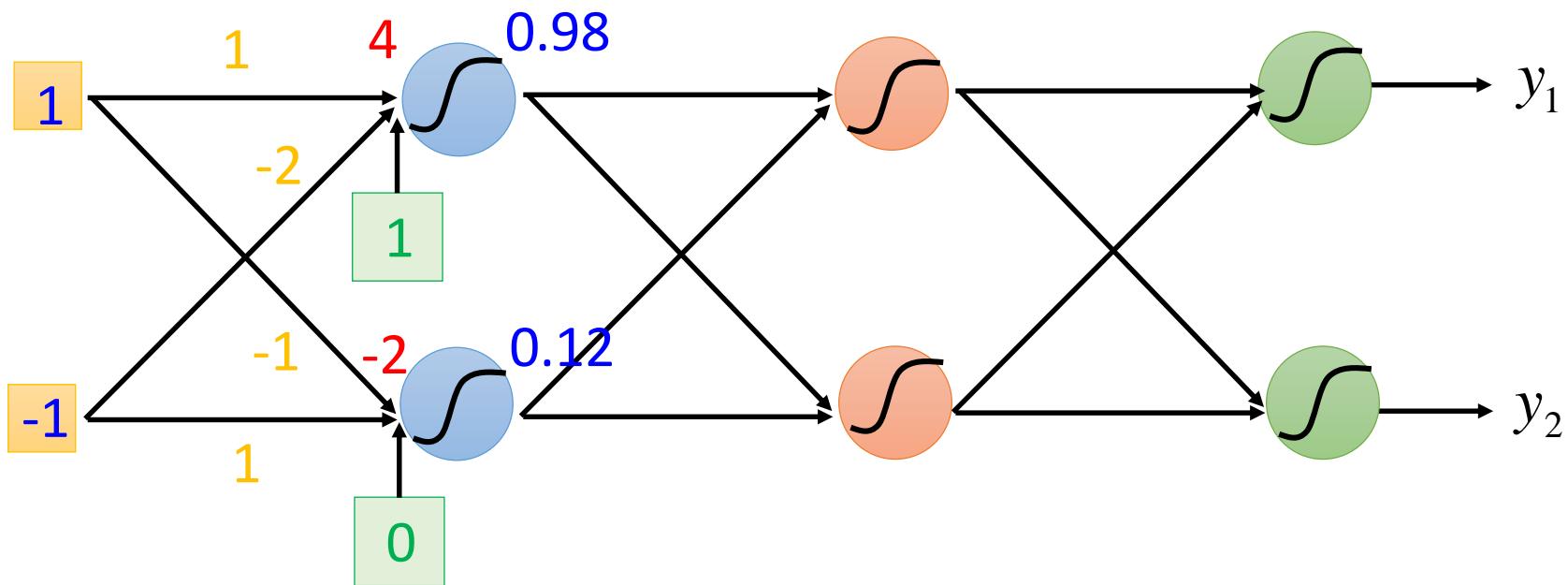
VGG
(2014)

GoogleNet
(2014)

Residual Net
(2015)

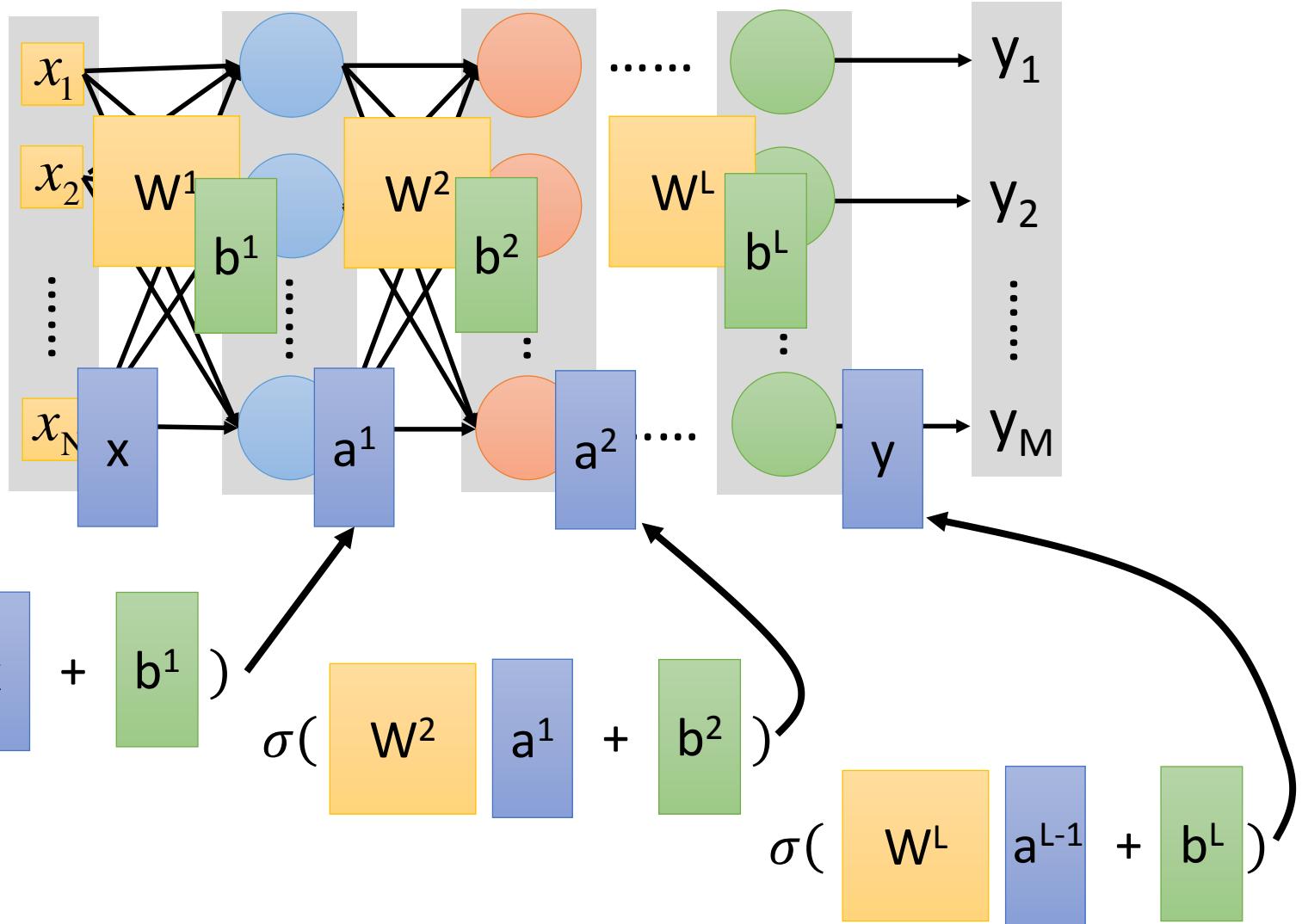
Taipei
101

Matrix Operation

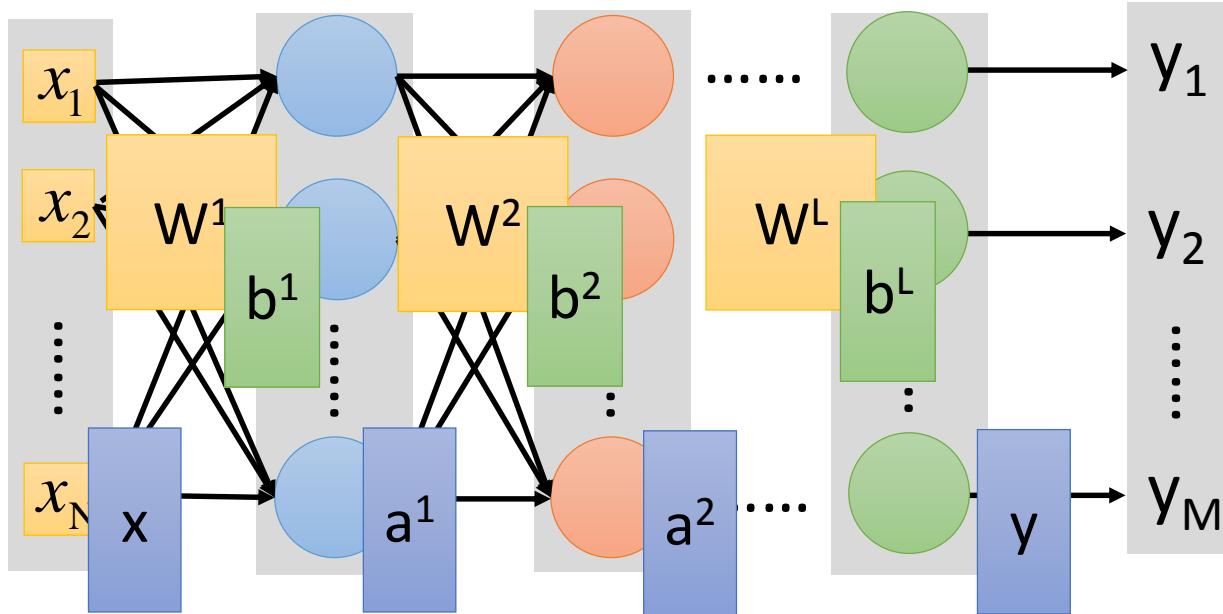


$$\sigma \left(\underbrace{\begin{bmatrix} 1 & -2 \\ -1 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ -1 \end{bmatrix} + \begin{bmatrix} 1 \\ 0 \end{bmatrix}}_{\begin{bmatrix} 4 \\ -2 \end{bmatrix}} \right) = \begin{bmatrix} 0.98 \\ 0.12 \end{bmatrix}$$

Neural Network



Neural Network



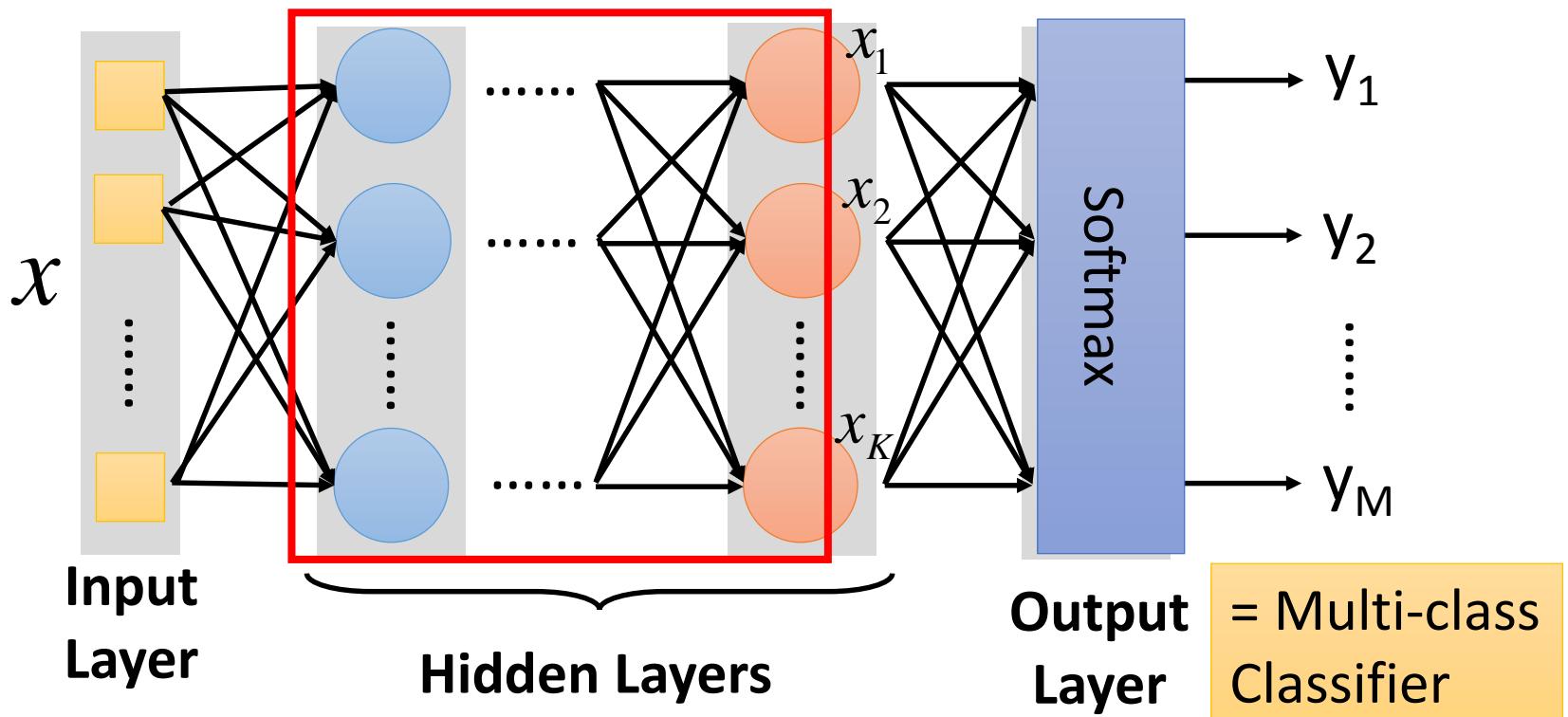
$$y = f(x)$$

Using parallel computing techniques
to speed up matrix operation

$$= \sigma(W^L \cdots \sigma(W^2 \sigma(W^1 x + b^1) + b^2) \cdots + b^L)$$

Output Layer as Multi-Class Classifier

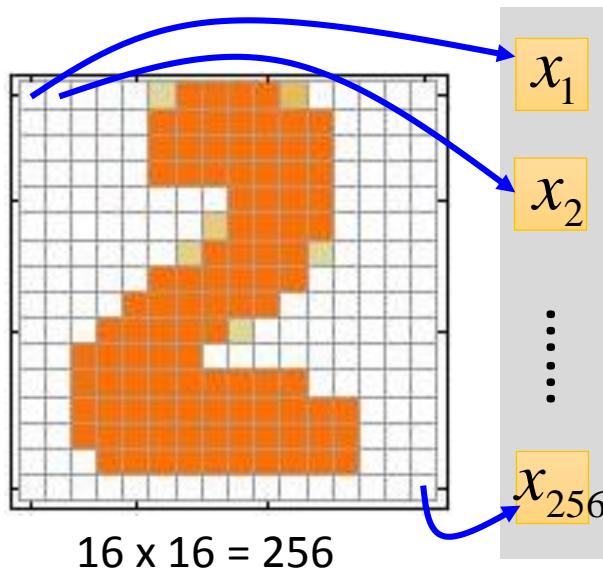
Feature extractor replacing
feature engineering



Example Application



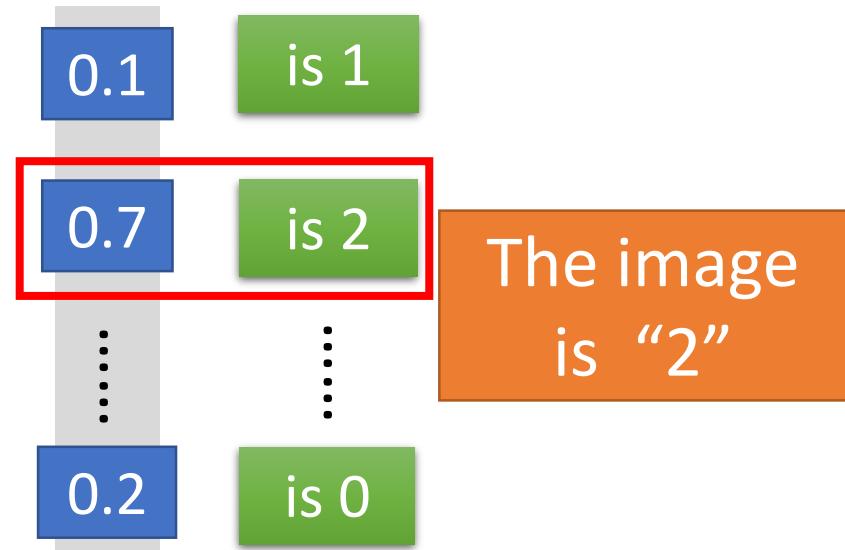
Input



Ink \rightarrow 1

No ink \rightarrow 0

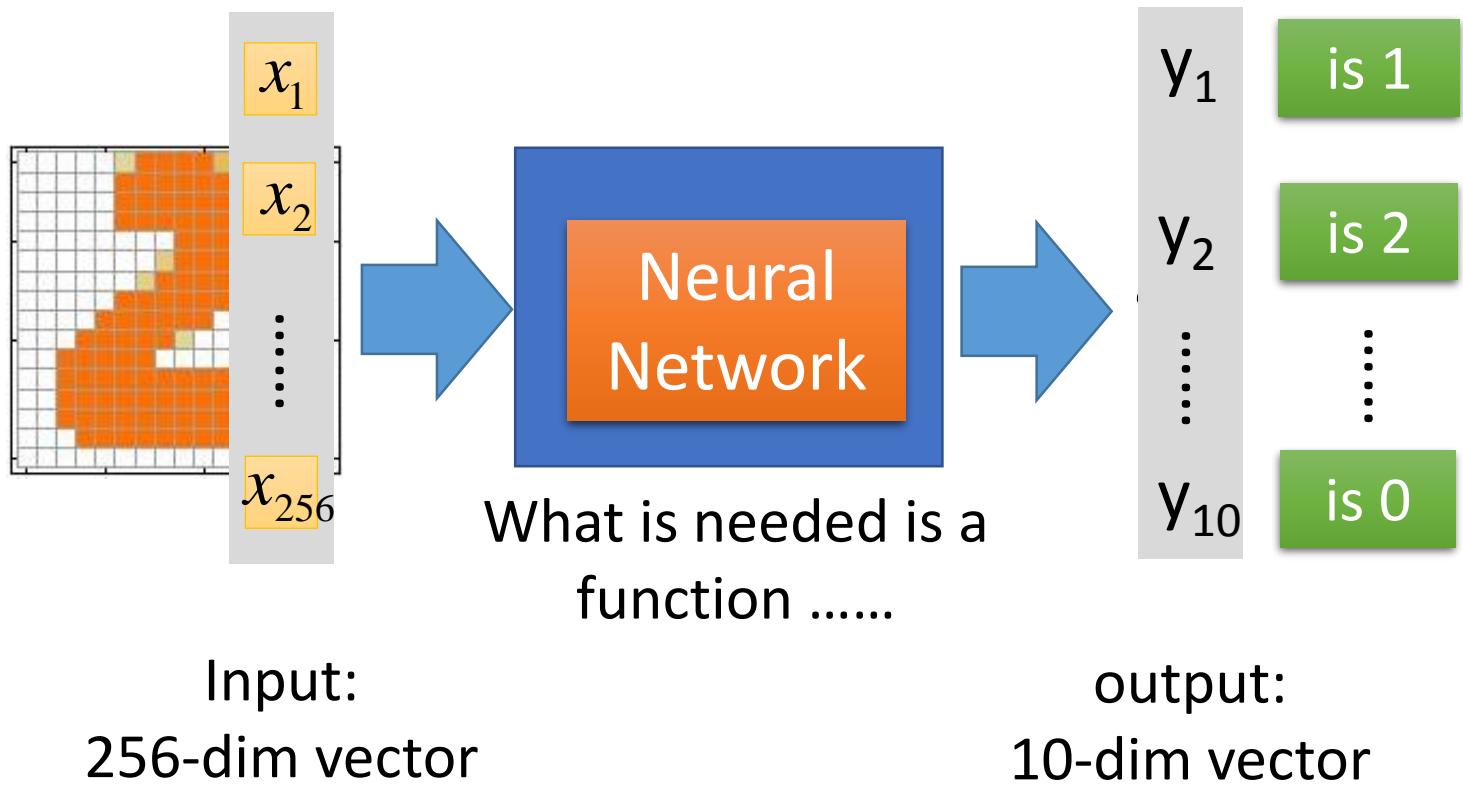
Output



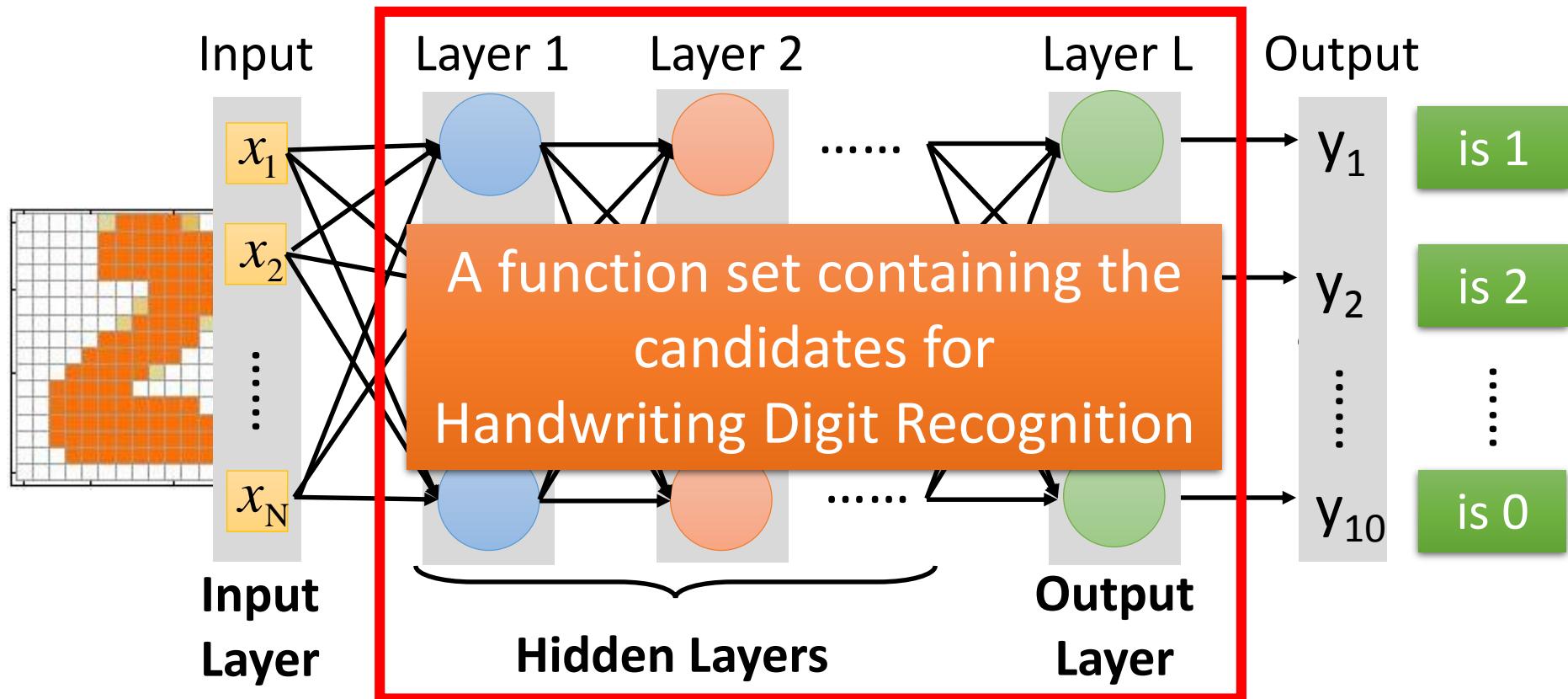
Each dimension represents the confidence of a digit.

Example Application

- Handwriting Digit Recognition

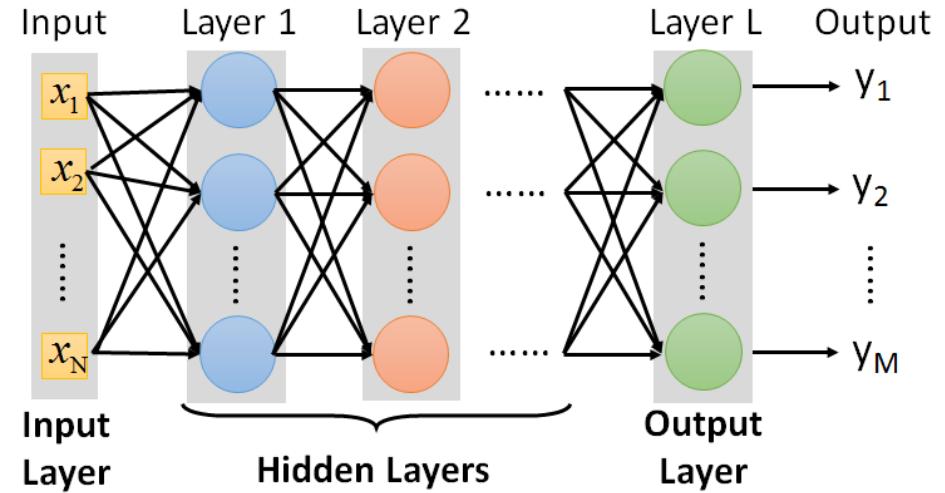


Example Application



You need to decide the network structure to let a good function in your function set.

FAQ



- Q: How many layers? How many neurons for each layer?

Trial and Error

+

Intuition

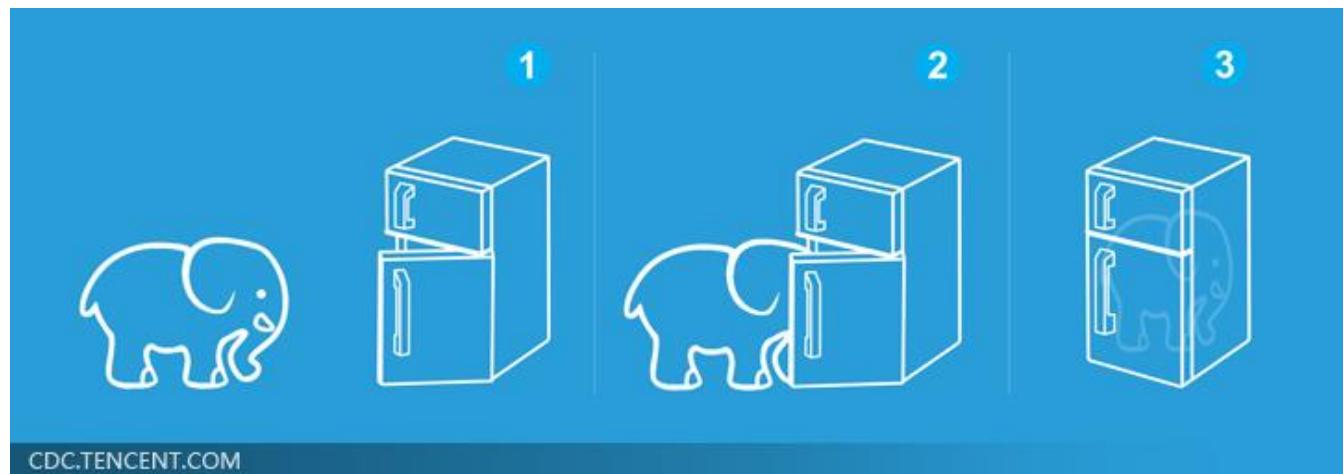
- Q: Can the structure be automatically determined?
 - E.g. Evolutionary Artificial Neural Networks
- Q: Can we design the network structure?

Convolutional Neural Network (CNN)

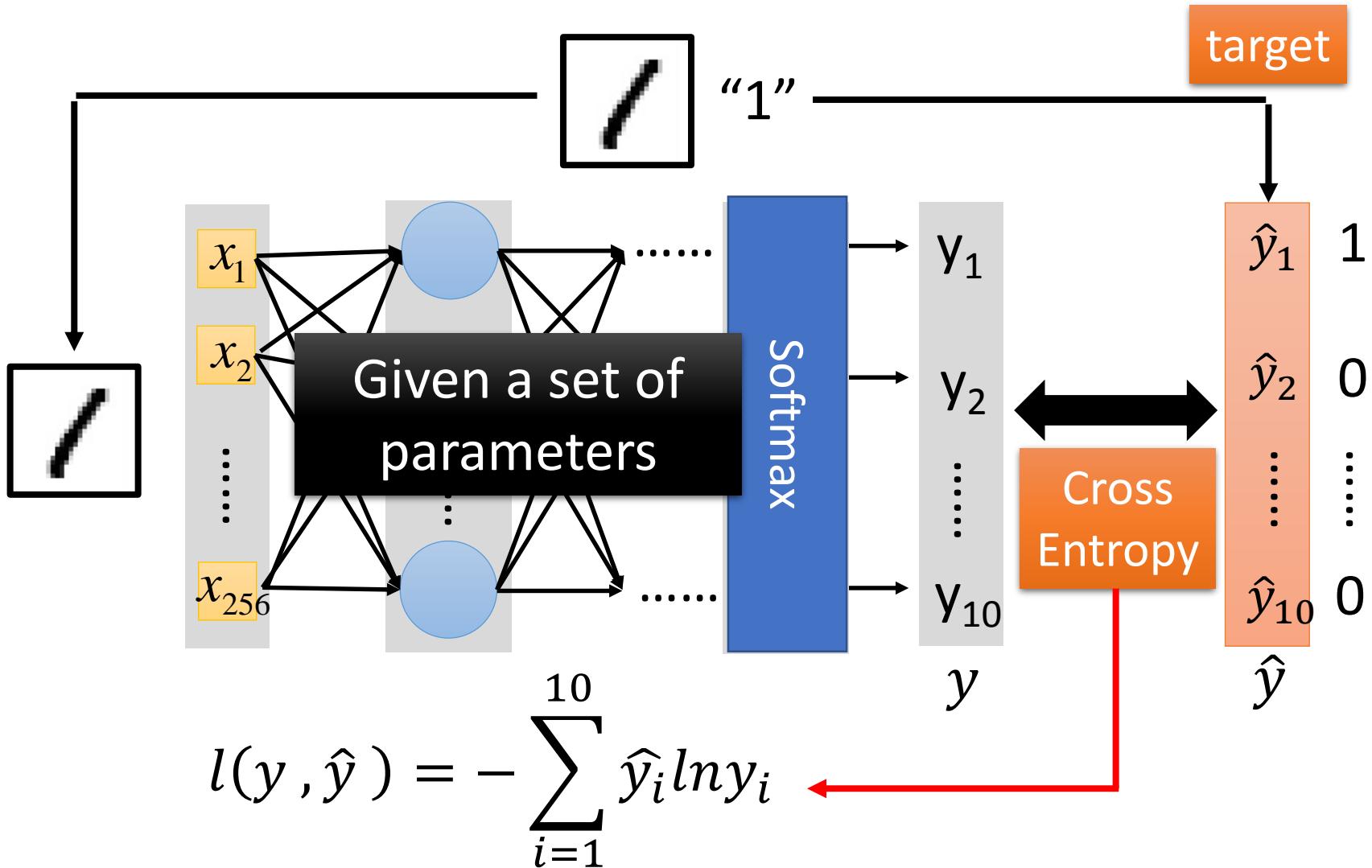
Three Steps for Deep Learning



Deep Learning is so simple

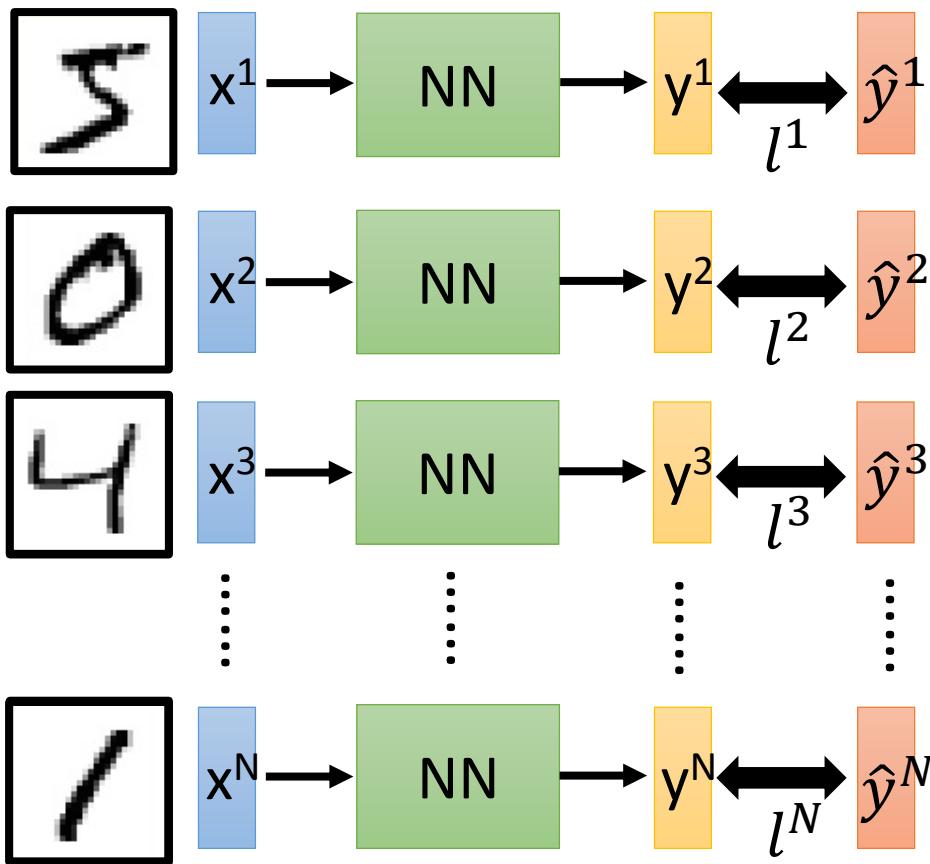


Loss for an Example



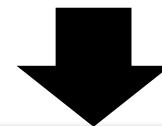
Total Loss

For all training data ...



Total Loss:

$$L = \sum_{n=1}^N l^n$$



Find a function in function set that minimizes total loss L

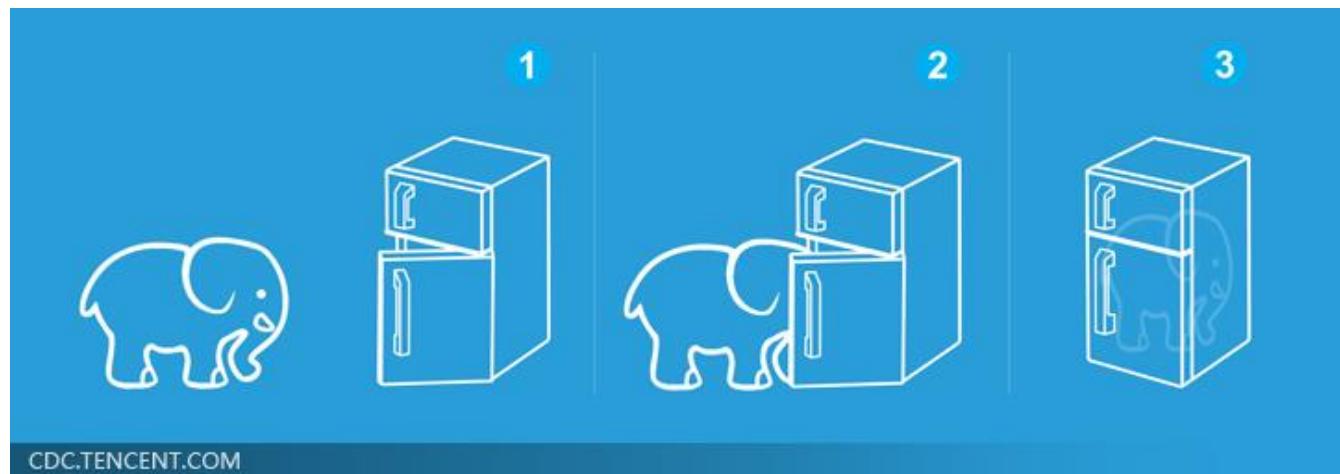


Find the network parameters θ^* that minimize total loss L

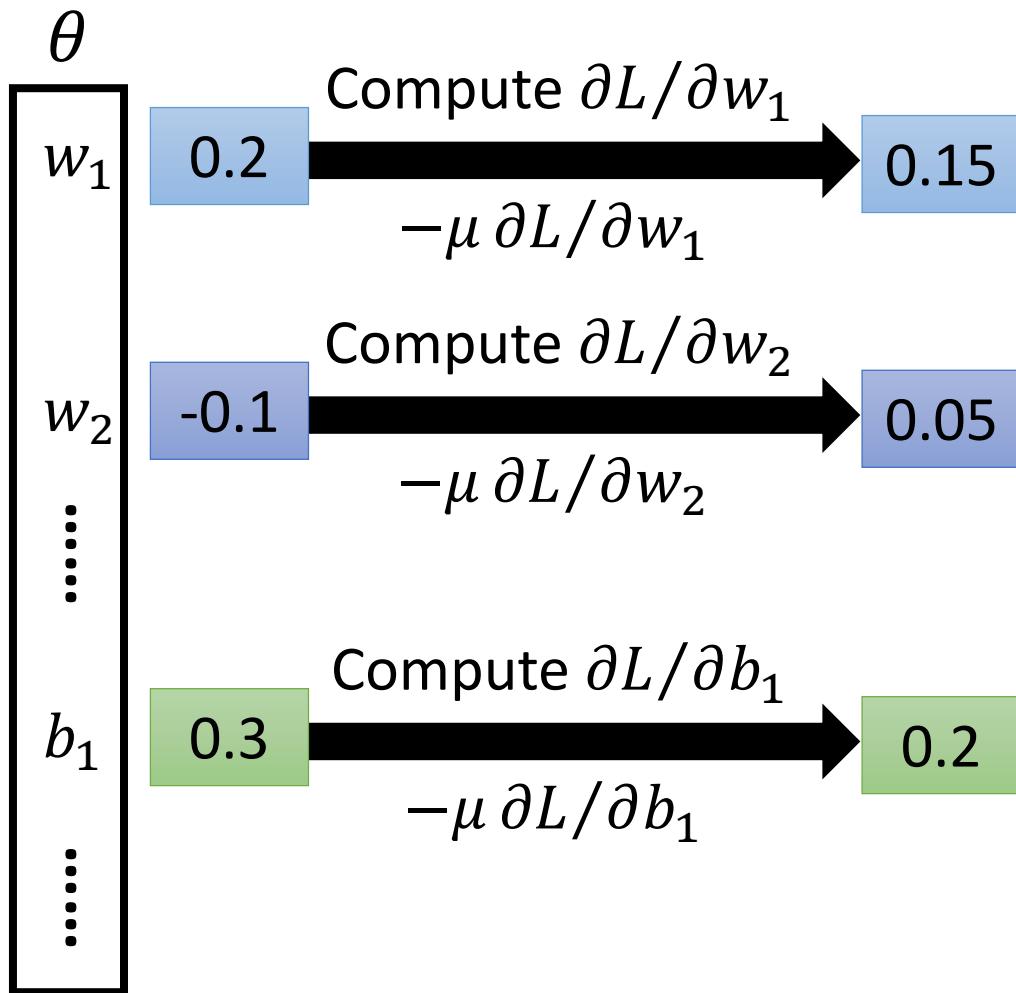
Three Steps for Deep Learning



Deep Learning is so simple



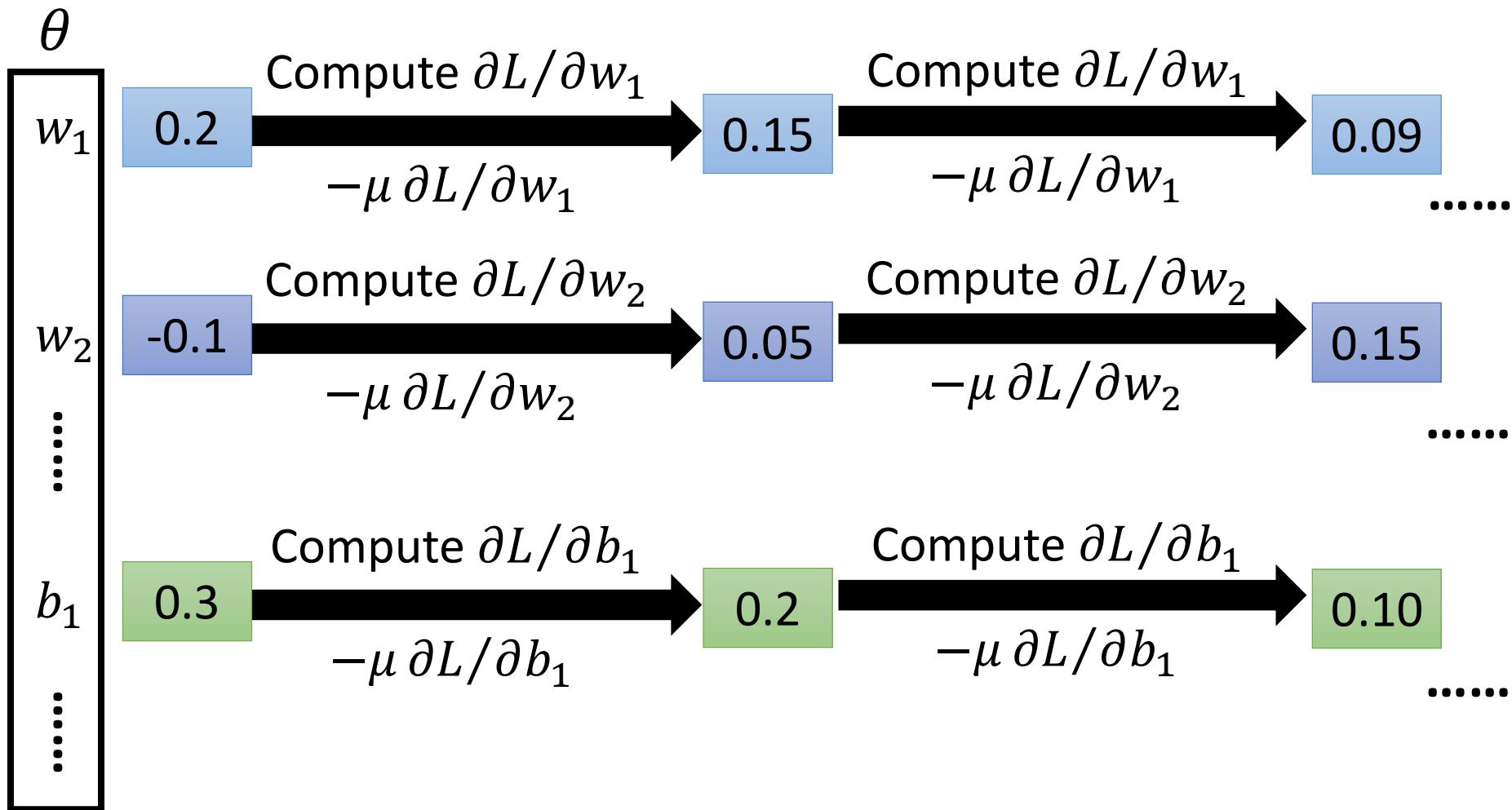
Gradient Descent



$$\nabla L = \begin{bmatrix} \frac{\partial L}{\partial w_1} \\ \frac{\partial L}{\partial w_2} \\ \vdots \\ \frac{\partial L}{\partial b_1} \\ \vdots \end{bmatrix}$$

gradient

Gradient Descent

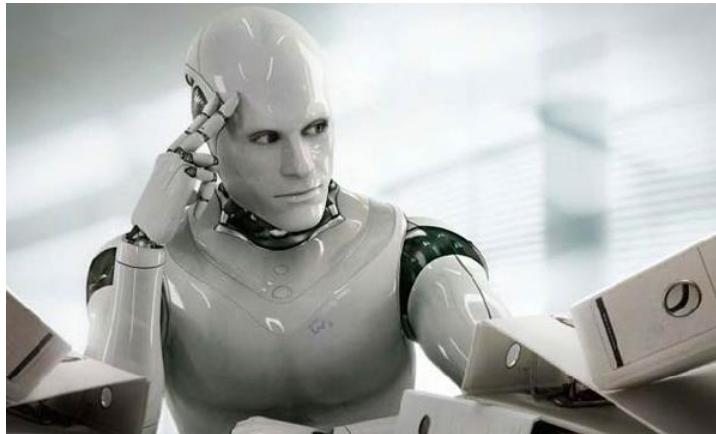


Gradient Descent

This is the “learning” of machines in deep learning

→ Even alpha go using this approach.

People image



Actually



I hope you are not too disappointed :p

Backpropagation

- Backpropagation: an efficient way to compute $\partial L / \partial w$ in neural network



Caffe



theano



libdnn
台大周伯威
同學開發

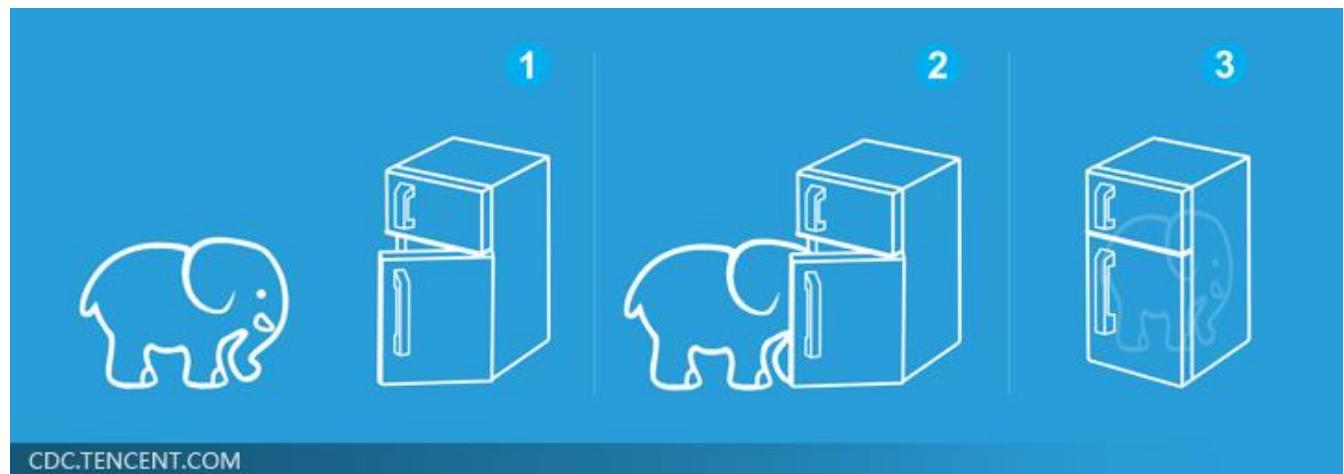
Ref:

http://speech.ee.ntu.edu.tw/~tlkagk/courses/MLDS_2015_2/Lecture/DNN%20backprop.ecm.mp4/index.html

Three Steps for Deep Learning



Deep Learning is so simple



Acknowledgment

- 感謝 Victor Chen 發現投影片上的打字錯誤

1.人工智能基础等课程备课中，积极运用国外优质网络资源，以下为下载的基于 BWAPI 的强人工智能研究的示例 AI 文档库资源截图

- 00_home
- 01_01-UAlbertaBot_Installation Instructions
- 01_01-UAlbertaBot_Installation Instructions_A01-BWTA 2.2 - Installation Instructions
- 01_02-Common Issues and Solutions
- 01_03-Artificial Intelligence Systems used in UAlbertaBot
- 01_04-Bot Design and Architecture
- 01_04-Bot Design and Architecture_01-How to Use the UAlbertaBot Configuration File
- 01_04-Bot Design and Architecture_01-How to Use the UAlbertaBot Configuration File_A01-UAlbertaBot Configuration File
- 01_04-Bot Design and Architecture_02-How to Modify Build Orders & Unit Production
- 01_04-Bot Design and Architecture_03-How to Modify Combat Logic and Unit Micromanagement
- 01_04-Bot Design and Architecture_04-How to Modify Worker Jobs and Allocation
- 01_04-Bot Design and Architecture_05-How to Modify Path Finding
- 02_00-Introduction
- 02_01-How to Download, Compile & Run
- 02_01-How to Download, Compile & Run_01-Compiling in Windows as part of a BWAPI StarCraft bot
- 02_01-How to Download, Compile & Run_02-Compiling in Windows as a standalone executable
- 02_01-How to Download, Compile & Run_03-Compiling in Linux as a standalone executable
- 02_02-Run Experiments Now - Standalone Windows Executable
- 02_02-Run Experiments Now - Standalone Windows Executable_01-Simulation Settings Instructions
- 02_02-Run Experiments Now - Standalone Windows Executable_01-Simulation Settings Instructions_01A-sample experiment configuration file
- 02_03-Artificial Intelligence Methods in SparCraft
- 02_03-Artificial Intelligence Methods in SparCraft_A01-Fast Heuristic Search for RTS Game Combat Scenarios
- 02_04-Simple SparCraft Coding Tutorial

2、向学生推荐的 bwapi 测试 AI 下载页面截图

[SSCAIT] Student StarCraft AI Tournament & Ladder
Organized by Department of Computer Science, Czech Technical University in Prague

[Discord](#)
[Facebook Group](#)
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[Home](#)
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[Tutorial](#)
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[Achievements & Portraits](#)

Upcoming Matches:
MadMixT vs. Zia bot | PurpleSpirit vs. MadMixT | krasio0 vs. MLFBbot | Slater vs. Egoberht | PurpleSwarm vs. Flash | MegaBot2017 vs. PurpleWave | Arrakhaner vs. Matej Iteník | Jakub Trancik vs. Flash | slyFORKnet vs. Andrey Kuriumov | Delingvery vs. Arrakhaner

To change the match schedule: [Vote for Players](#)
To see bot's ELO in more detail: [Show Big ELO Chart](#)

ELO Ratings over Time

This chart displays the ELO rating over time. By default, only the bots with ELO higher than 2150 are displayed. Add more bots to the chart by clicking their name in the legend.

Bots and Score:

NAME	RACE	Elo RATING*	ICCUP FORMULA*	SSCAIT RANK*	WIN RATE (LAST 50 GAMES)	WINS	LOSSES	DESCRIPTION	LATEST ACHIEVEMENTS	DIVISION	STATUS	UPDATED
Stardust	Zerg	3230	7871	B	74%	541	126	https://github.com/bmnielsen/Stardust		Mixed	Enabled	2020-10-01 14:31:50

Can play both Terran and Zerg