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课程概要

Self-introduction

Name: Si Liu (刘偲)

Major: Artificial Intelligence

Deep Learning , Computer Vision

Natural Language Processing

Webpage : <http://colalab.org/>

AAAI 2011
San Francisco



Golden Gate Bridge

CVPR 2012
Rhode Island



ACM 2013
Barcelona

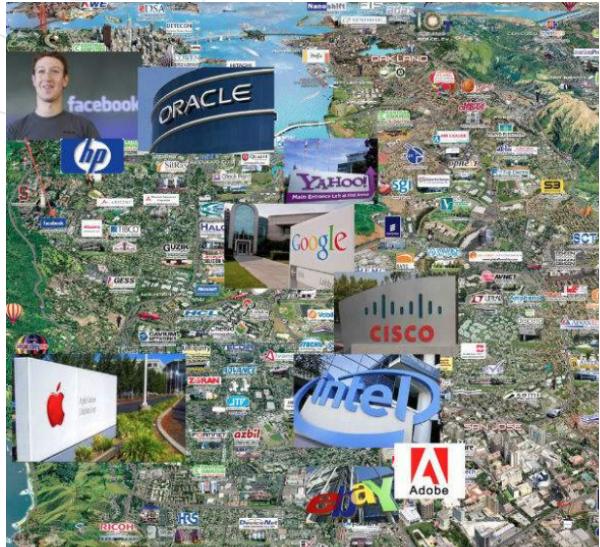


ACM 2012
Rhode Island

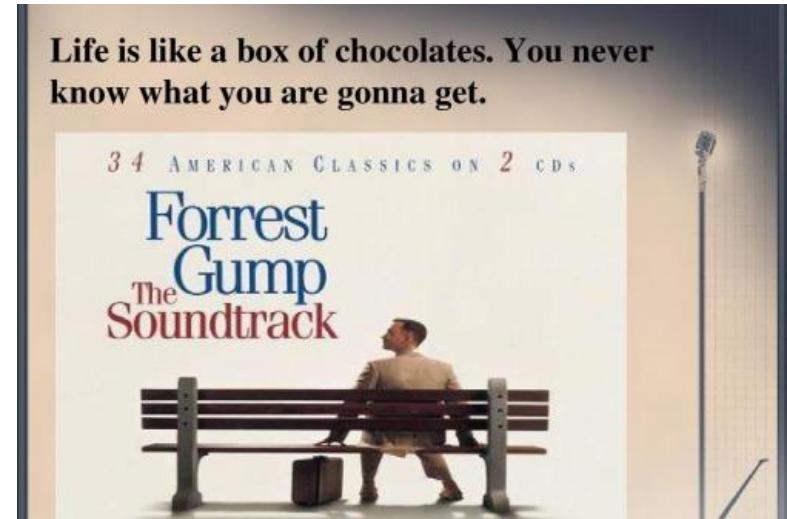


San Francisco 电影阿甘正传插曲

- If you're going to San Francisco
- Be sure to wear some flowers in your hair
- If you're going to San Francisco
- You're gonna meet some gentle people there
- For those who come to San Francisco
- Summertime will be a love-in there



Silicon Valley



Stanford University

Barcelona



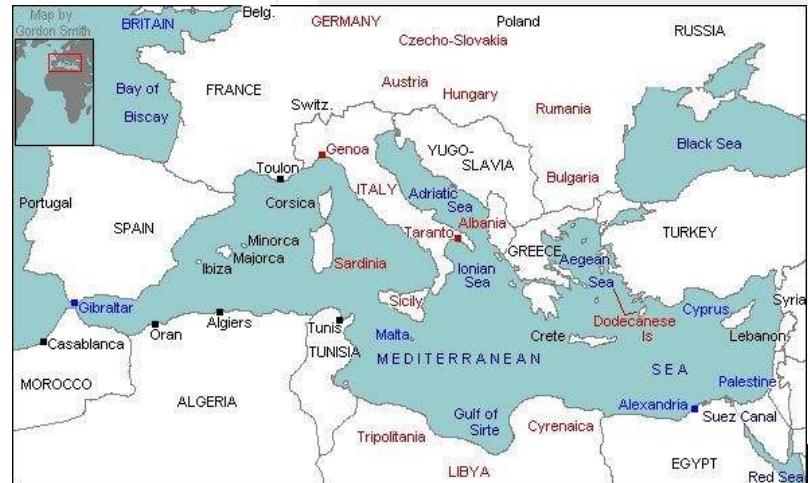
Camp Nou, largest stadium in Europe



Sagrada Família, Catholic church, architect Antoni Gaudí



F1 circuit: closest to perfect runway



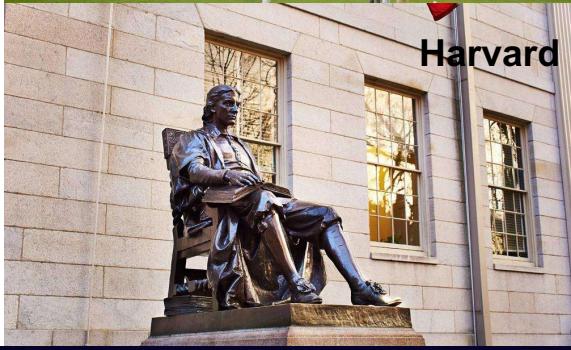
Mediterranean Sea

ICCV 2013
Sydney



CVPR 2017
Hawaii

CVPR 2015
Boston



CVPR 2018
Salt Lake

ECCV 2018
Munich



Munich['mjunɪk]



The Munich Oktoberfest



New Swan Stone Castle: prototype of Disneyland



BMW Building



Maria square: urban living room

CVPR 2019
Long Beach



CVPR 2020
Seattle



Seattle



Finding Mr. Right



Boeing (Chicago)



Microsoft (Redmond)



StarBucks

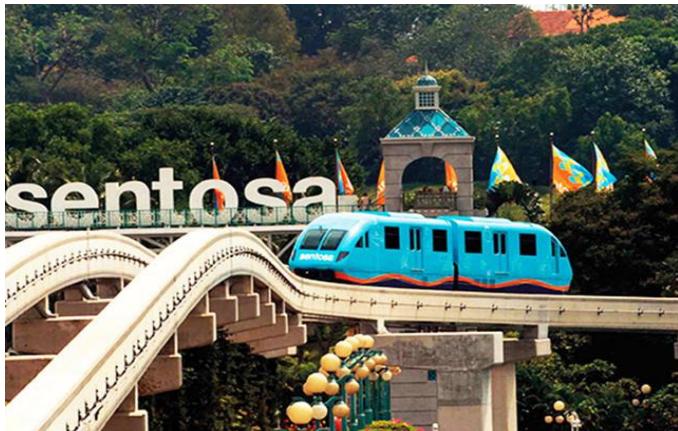


Amazon (4 Billion USD)

Singapore



Casinos

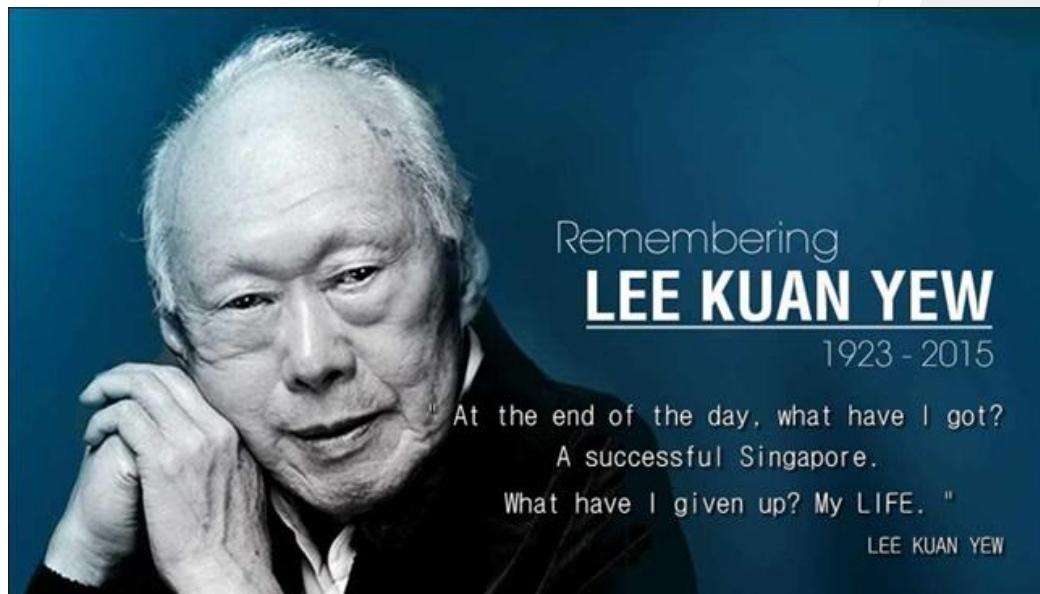


Resorts World Sentosa and Universal Studios



Stefanie Sun Yan Zi

- Lee Kuan Yew (李光耀) was the first Prime Minister of the Republic of Singapore, governing for three decades. He is also widely recognized as the founding father of modern Singapore. He oversaw the separation of Singapore from Malaysia in 1965 and its subsequent transformation from a relatively underdeveloped colonial outpost (殖民地) with no natural resources into a "First World" Asian Tiger. He is one of the most influential political figures in Southeast Asia.



- Education



National University of Singapore



Nanyang Technological University



课程目标

- 阅读科技文章，掌握高频词汇
- 学习科技论文，了解论文写作
- 完成科技主题汇报



课程考核

- 出勤 : 10%
- 课堂作业 : 30%
- 课堂表现 : 20%
- 期末测试 : 40%

2

Fun facts about the Nobel Prize

<https://www.straitstimes.com/world/7-fun-facts-about-the-nobel-prize>

<https://www.scientificamerican.com/article/12-surprising-facts-about-nobel-prizes/>

WHAT IS THE NOBEL PRIZE?

The Nobel Prize refers to one of the highest international honours awarded for contributions to the fields of Physics, Chemistry, Physiology [*fízí'a:lədʒi*] or Medicine, Literature and Peace. The first of the Nobel Prizes was handed in 1901.

There is no Nobel Prize in Economics, but outstanding economists are **eligible** [*'elɪdʒəblɪ*] for the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, established by [swidən]Sweden's central bank in 1968.



- ✓ There is no Nobel Prize in Economics, but outstanding economists are **eligible** for the Sveriges Riksbank Prize.
- ✓ Only those over 70 are eligible for the special payment
(特别津贴) .

eligible ['elɪdʒəbl]

adj. 合格的，合适的；符合条件的；有资格当选的

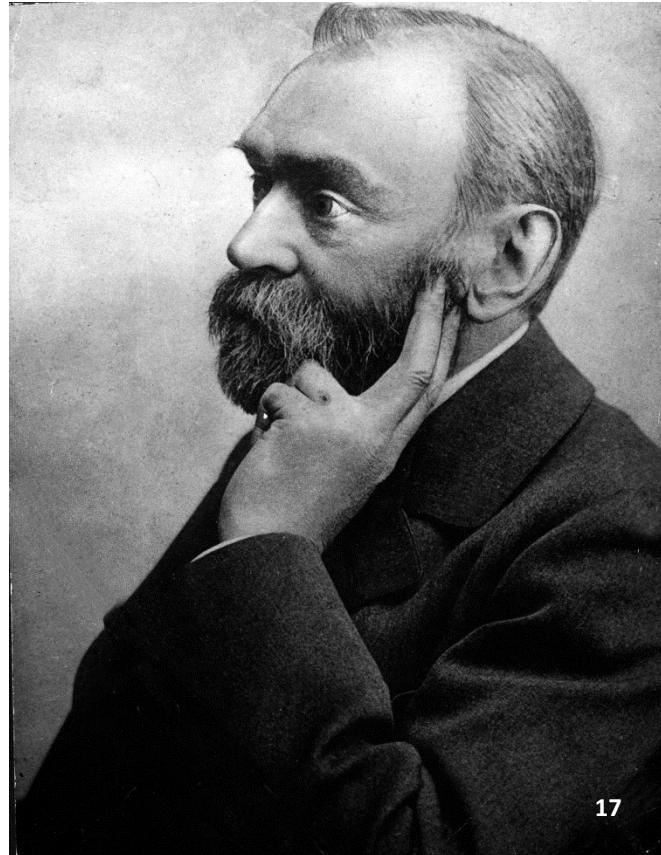
n. 合格者；适任者；有资格者

HOW DID IT COME ABOUT?

The Nobel Prizes were set up in the will of Alfred Nobel.

His claim to fame (成名), however, stems [stɛm] from his invention of dynamite ['daɪnə,maɪt] 炸药.

Upon (当。。。的时候) discovering his intention to give away all his money, Nobel's family **strenuously** ['strɛnjuəsli] 努力 objected to the establishment of the Nobel Prizes, leading to a delay in the awards being given out.



- ✓ Upon discovering his intention to give away all his money, Nobel's family **strenuously** objected to the establishment of the Nobel Prizes.
- ✓ She acknowledged she made a mistake but has strenuously denied any criminal wrongdoing 犯罪行为.

strenuously ['strənjuəsli]

adv. 勤奋地; 费力地; 全力以赴地

WHO MAKES THE DECISION?

In accordance with (按照) Nobel's will, the Royal Swedish Academy of Sciences 瑞典皇家科学院 administers (管理) the Nobel Prize in Physics and Chemistry. It was also given the responsibility for the Nobel Prize in Economic Sciences in 1969.

The Karolinska Institutet, a medical university in Sweden, manages the Nobel Prize in Physiology or Medicine.

The Swedish Academy, founded in 1786 by King Gustaf III to promote the Swedish language and literature, awards the Nobel Prize in Literature.

The Nobel Peace Prize is decided by a five-person committee elected by the government.

WHAT DO YOU GET FOR WINNING A NOBEL PRIZE?

Prize winners are called laureates['lɔrɪət].

Nobel laureates receive gold medals as well as diplomas证书 decorated with the work of famous artists.

The prize money comes out of income from investments made with the Nobel's money. The full prize is currently 8 million kronor (克朗, \$1.3 million).



- ✓ Prize winners are called laureates.
- ✓ Chinese musicians gradually became a remarkable group in the international music circle, and more and more Chinese musicians became laureates of notable International Competitions.

laureate ['lɔrɪət]

adj. 戴桂冠的; 荣誉的
n. 桂冠诗人; 得奖者

WHO WINS NOBEL PRIZES?

Malala Yousafzai, who won the 2014 Nobel Peace Prize at the age of 17, is the youngest Nobel winner.

The oldest, Leonid Hurwicz, was 90 when jointly awarded the economics prize in 2007.

Curie was the first woman to win a Nobel Prize.

More than forty-eight women have **clinched**[klɪn(t)] the awards, with Marie Skłodowska Curie taking the prize home twice - for physics in 1903 and chemistry in 1911.



- ✓ More than forty-eight women have **clinched** the awards, with Marie Skłodowska Curie taking the prize home twice.
- ✓ Evidently this information clinched the matter 解决了问题.

clinch [klɪn(t)]

v. 赢得; 最终确定或解决
n. 拥吻

HOW MUCH IS IT WORTH?

Only two people have ever sold their prizes.

Physics winner Leon Lederman, **who won in 1988 for his co-discovery of the neutrino**[nu'trino] (中微子), sold his Nobel earlier to cover medical care expenses. The buyer, **whose identity was not released**, paid \$765,000 for it.

Russian billionaire Alisher Usmanov paid \$4.7 million to buy the gold Nobel medal awarded to biologist James Watson for his work discovering DNA's double helix (双螺旋结构), **but he then gave the medal back to the laureate**. Usmanov said the medal should remain with the winner and the money he paid for it should go toward research.

爸爸有钱



WOULD YOU EVER SAY NO TO A NOBEL PRIZE?

Two Nobel laureates declined their prizes.

The existentialist [ɛgzɪs'tenʃəlɪst] (存在主义哲学家) Jean-Paul Sartre, **having refused all official honours**, could hardly say yes to his 1964 Nobel Prize in Literature.

And Vietnamese communist (共产主义) leader Le Duc Tho, who was jointly awarded the 1973 Peace Prize with US Secretary (国务卿) of State Henry Kissinger, **said he could not accept it when peace had not been achieved in Vietnam.**

Adolf Hitler also forbade Richard Kuhn, Adolf Butenandt and Gerhard Domagk from accepting their prizes in 1938 and 1939, while the Soviet Union forced Boris Pasternak to turn down (拒绝) his 1958 literature award. Later, all of them eventually went on to receive their diploma and medal but not the prize cash.



- ✓ Two Nobel laureates **declined** their prizes.
- ✓ The number of staff has declined from 217,000 to 114,000.

declined [dɪ'klain]

n. 下降；衰退；斜面

vi. 下降；衰落；谢绝

vt. 谢绝；婉拒

WHY ARE YOU SO STRONG?

When John Bardeen co-won the Physics Nobel in 1956 for helping develop a theory of superconductivity ['su:pər'kandʌk'tɪvəti] (超导) known as the BCS theory, he left most of his family at home rather than bringing them along for the awards ceremony.

"His son told me that his father wanted them all to stay in school and study for whatever tests they had," explains Scientific American video editor.

The laureate promised he'd bring them "the next time." Then, in 1972 Bardeen **indeed** won a second Nobel (making him the third person in the history of the prize to win twice). That time, he made sure to bring his entire family.



- ✓ The laureate promised he'd bring them "the next time."
Then, in 1972 Bardeen **indeed** won a second Nobel.
- ✓ 'Was he very angry?' 'Indeed he was.'

indeed [ɪn'di:d]

adv. 的确；实在；真正地；甚至

2

College News

Artificial intelligence senses people through walls



“RF-Pose,” uses artificial intelligence (AI) to teach wireless devices to sense people’s postures and movement, even from the other side of a wall.

X-ray vision has long seemed like a **far-fetched sci-fi fantasy**(牵强附会的科学幻想), but over the last decade a team led by Professor Dina Katabi from MIT’s Computer Science and Artificial Intelligence Laboratory [lə' bɔrətri] (CSAIL) has continually gotten us closer to seeing through walls.

Artificial intelligence senses people through walls



Artificial intelligence senses people through walls

The team says that RF-Pose could be used to monitor diseases like Parkinson's, multiple sclerosis [sklə'rosɪs] (多发性硬化症) (MS), and muscular dystrophy(['distrəfɪ], 肌肉萎缩症), providing a better understanding of disease **progression** and allowing doctors to adjust **medications** accordingly.

It could also help elderly people live more independently, while providing the added security of monitoring for falls, injuries and changes in activity patterns. The team is currently working with doctors to explore RF-Pose's applications in health care.



progression /prə'grɛʃən/

noun 进展；发展；前进

pattern /'pætən/

noun 方式，形式；模式
noun 图案，花样

Drugs can slow down the **progression** of the disease.

药物能减缓疾病的恶化。

The **pattern** of family life has been changing over recent years.
近年来家庭生活的模式一直在变化。

Changing **patterns** of agriculture are threatening the countryside.
不断变化的农业模式正威胁着农村。

The curtains had a floral **pattern**.
窗帘上有花的图案。

Artificial intelligence senses people through walls

Besides health care, the team says that RF-Pose could also be used for new classes of video games **where** players move around the house, or even in search-and-rescue missions to help locate survivors.

All data the team collected has subjects' **consent** and is **anonymized** [ə'nɒnɪmaɪz] and **encrypted** to protect user privacy. For future real-world applications, they plan to implement a "consent **mechanism** ['mek(ə)nɪz(ə)m]" in which the person who installs the device is cued to do a specific set of movements in order for it to begin to monitor the environment.



consent /kən'sent/

noun & verb 许可，允许；同意

anonymize /ə'nɒnimaiz/

verb 匿名化，无名化处理

encrypt /ɪn'kript/

verb 把...编码；把...加密

mechanism /'mek.ə.nizəm/

noun 体制，结构方式

You can only come on
the trip if your parents give their **consent**.
只有你父母允许，你才能参加这次旅行。

We **anonymize** the data so researchers
cannot identify any individual subjects.

我们将数据做匿名化处理，这样研究人员就无法辨认单个的实验对象。

Your financial information is fully **encrypted**
and cannot be accessed.

有关你财务状况的信息已被完全加密，别人无法看到。

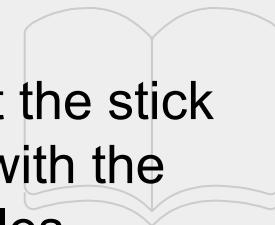
The **mechanism** for collecting taxes needs
revising.

收税制度需要修改。

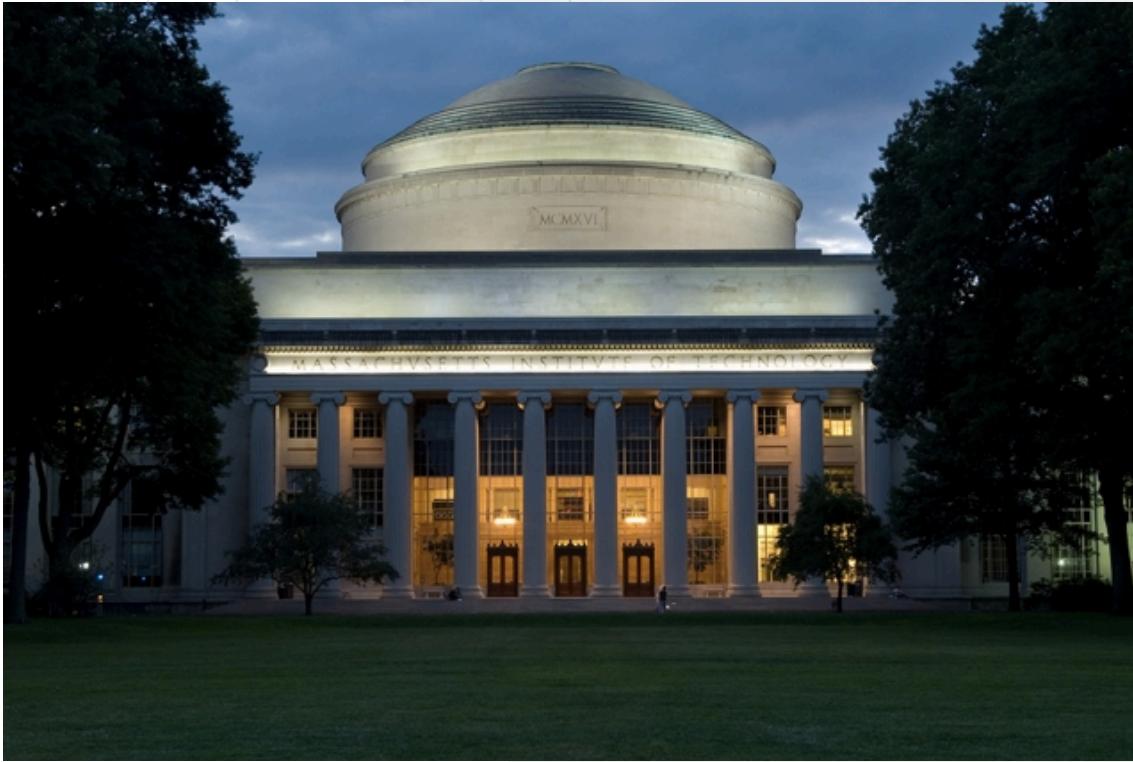
Artificial intelligence senses people through walls

The researchers collected examples using both their wireless device and a camera. They gathered thousands of images of people doing activities like walking, talking, sitting, opening doors and waiting for elevators.

They then used these images from the camera to extract the stick figures, which they showed to the neural network along with the **corresponding** radio signal. This combination of examples enabled the system to learn the association between the radio signal and the stick figures of the people in the scene. Post-training, RF-Pose was able to estimate a person's posture and movements without cameras, using only the wireless reflections that bounce off people's bodies.



MIT reshapes itself to shape the future



Gift of \$350 million establishes the MIT Stephen A. Schwarzman College of Computing, an **unprecedented** (无前例的) \$1 billion commitment to world-changing breakthroughs and their ethical 伦理的 application.



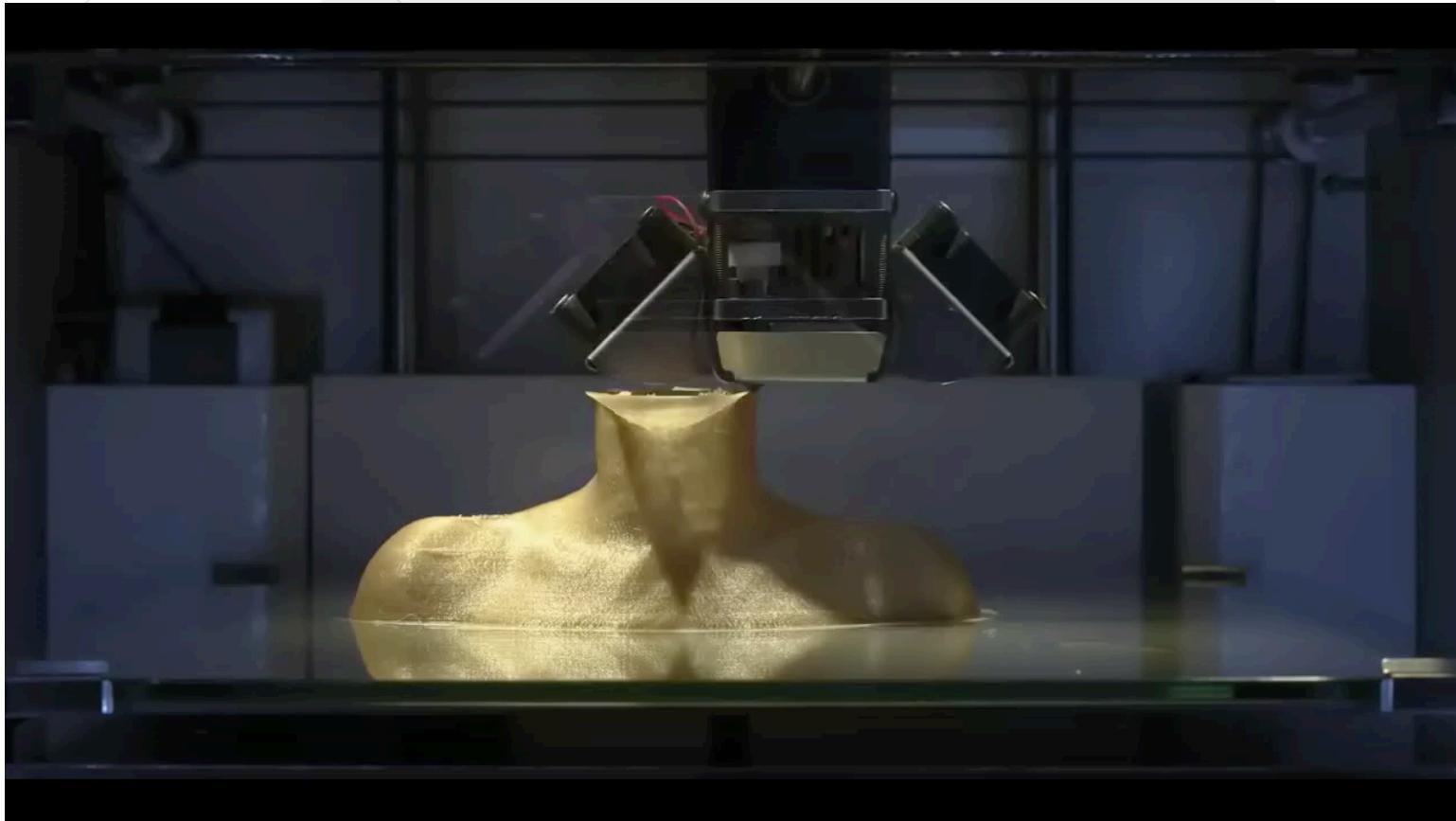
unprecedented /ʌn'prezɪdəntɪd/
adjective 史无前例的；绝无仅有的

This century has witnessed environmental destruction on an **unprecedented** scale.
环境在本世纪遭到了空前的破坏。

Such a move is rare, but not **unprecedented**.
这种做法很罕见，但也不是没有先例的。

China's industry is developing at an **unprecedented** rate.
中国工业正以空前的速度发展。

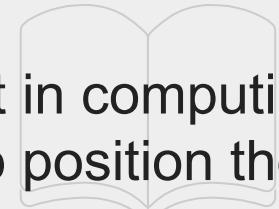
MIT reshapes itself to shape the future



MIT reshapes itself to shape the future

MIT today announced a new \$1 billion commitment to address the global opportunities and challenges presented by the **prevalence** (流行) of computing and the rise of artificial intelligence (AI).

The **initiative** (倡议) marks the single largest investment in computing and AI by an American **academic institution**, and will help position the United States to lead the world in preparing for the **rapid evolution** of computing and AI.





prevalence /'prevələns/

noun 流行；普遍；广泛

initiative /ɪ'nɪʃətɪv/

noun 倡议；新措施；主动性

This attack has shined the spotlight on the **prevalence** of violence against girls and women.
这次袭击使人们注意到对女孩和妇女的暴力行为普遍存在。

WHO recognizes that the increasing **prevalence** of childhood obesity results from changes in society.
世卫组织认识到儿童期肥胖症日趋流行是社会变化的结果。

COVID-19 is **prevalent** all over the world
新冠病毒在全世界范围内流行。

The peace **initiative** was welcomed by both sides.
和平倡议受到了双方的欢迎。

You won't get much help. You'll have to use your **initiative**.
你不会得到多少帮助的。你得自己想办法。

MIT reshapes itself to shape the future

“As one of the world leaders in technological innovation, MIT has the right **expertise** and the right values to serve as the ‘true north’ 真正的价值 of AI in pursuit of the answers we urgently need,” Mr. Schwarzman adds.

“Our hope is that this ambitious initiative serves as a clarion call 吹响号角 to our government that massive financial investment in AI is necessary to ensure that America has a leading voice in shaping the future of these powerful and **transformative** technologies.”

expertise /'ek.spɜ:tɪz/

*noun*专门技能（知识）；专长

Transformative
[træns'fɔ:mətɪv]

*adj.*有改革能力的，变化的，变形的

She has considerable **expertise** in French history.
她研究法国历史有很深的造诣。

It's a team unrivalled in stature, **expertise** and credibility.

这个团队的名声、专业技能和信誉都是无可匹敌的。

This will be a **transformative** version of the rental model. We're incredibly excited about it.

这将是一个转型版本的租赁模式，我们对此是难以置信地激动。

The impressive part is that the same guy had a hand in so many **transformative** changes.
令人钦佩的是，他一个人参与了这么多翻天覆地的变革。

3

Apple and Steve Jobs

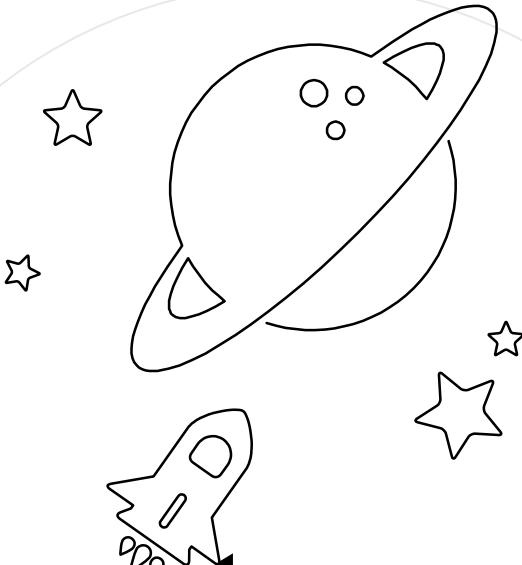
About Apple Inc.

- Apple Inc. is an American multinational technology company headquartered in Cupertino[.ku:pə'ti:nou]丘珀蒂诺, California, that designs, develops, and sells consumer electronics, computer software, and online services.
- The company's products include the iPhone smartphone, macOS and iOS operating systems and iOS App Store.



Establishment and evolution

- Apple was founded by Steve Jobs, Steve Wozniak, and Ronald Wayne in April 1976. It was incorporated as Apple Computer, Inc.
- ***In January 2007, Jobs renamed the company Apple Inc., reflecting its shifted focus toward consumer electronics***, and announced the iPhone, which saw critical acclaim (评论界的赞赏) and significant financial success.
- In August 2011, Jobs resigned as CEO due to health complications (困难), and Tim Cook became the new CEO. Two months later, Jobs died, marking the end of an era 时代 for the company.



Biggest company

In August 2018, Apple became the first public U.S. company to be valued at over US\$1 trillion (万亿) .



*Steve Jobs:
Genius of the times
时代的天才*



- Steven Paul Jobs was an American business magnate (巨头) and investor.
- Jobs is widely recognized as a pioneer of the microcomputer revolution of the 1970s and 1980s, along with Apple co-founder Steve Wozniak.



Jobs was

- ✓ the chairman, chief executive officer (CEO), and co-founder of Apple Inc.;
- ✓ chairman and majority shareholder of Pixar;
- ✓ a member of The Walt Disney Company's board of directors following its acquisition [,ækwi'zɪʃən] (收购) of Pixar;
- ✓ the founder, chairman, and CEO of NeXT.

board [bɔrd]

n. 董事会；木板；甲板；膳食

vt. 上（飞机、车、船等）；用板盖上；给提供膳宿
vi. 寄宿

1. A member of The Walt Disney Company's board of directors following its acquisition of Pixar.
2. The boy pounded the nails into the board.
3. We board at her house.

Anecdotes [ˈænəkˌdouts] (逸事) little known facts

of Jobs



TRUE STORY

Jobs and changing the world

In 1983, Apple co-founder Steve Jobs was looking for a new CEO to run his burgeoning (['bə:dʒənɪŋ] 快速发展的) company, who could help upstart Apple challenge all-powerful IBM.

He tapped (委任) John Sculley, the CEO of Pepsi-Cola. To convince Sculley to take the job, he asked the Pepsi exec:

“Do you want to spend the rest of your life selling sugared water, or do you want a chance to change the world?”



burgeoning ['bə:dʒənɪŋ]

v. (burgeon的ing形式) 成长; 迅速发展

adj. 增长迅速的; 生机勃勃的

1. In 1983, Apple co-founder Steve Jobs was looking for a new CEO to run his burgeoning company.
2. And one of the best illustrations of this transformation is China's burgeoning trade relationship with the United States.
3. These efforts were insufficient to contain 抑制 the burgeoning crisis.

Jobs and surprising

One day when a secretary was late, Jobs demanded to know why. The secretary said, “My car wouldn’t start”.

That afternoon, Jobs walks into her office, throws a set of keys to a brand new Jaguar['dʒægjuə(r)] (捷豹) and says, “Here, don’t be late anymore.”

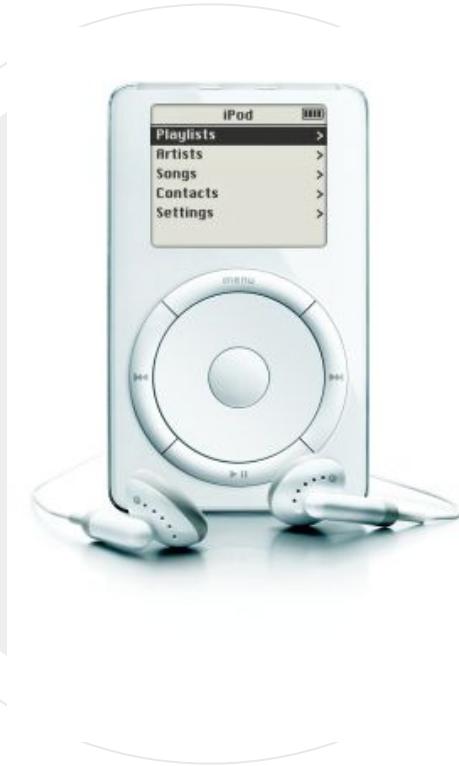
Jobs was always doing things like that, surprising people.

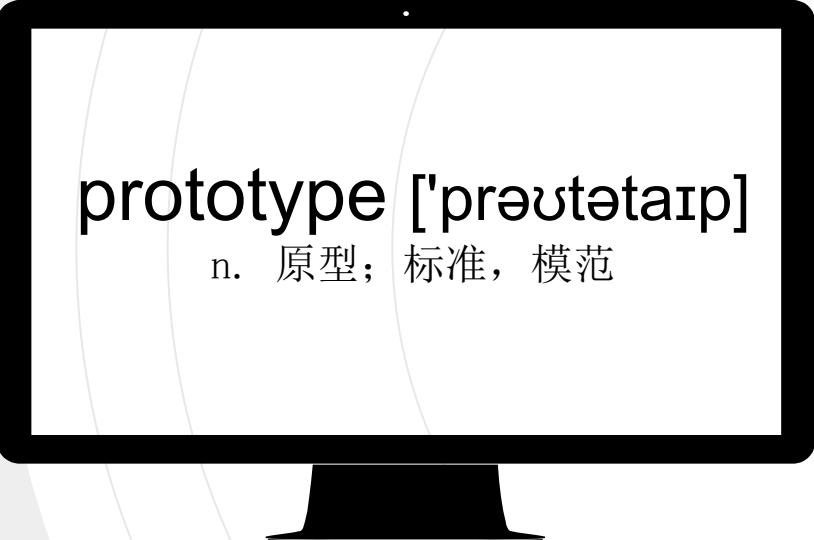


Jobs and perfectionism

When engineers working on the very first iPod completed the prototype, they presented their work to Steve Jobs for his approval. Jobs played with the device, scrutinized ['skrutn,aɪz] (细查) it, weighed it in his hands, and promptly rejected it. It was too big.

The engineers explained that it was simply impossible to make it any smaller. Jobs was quiet for a moment. Finally he stood, walked over to an aquarium [ə'kwerɪəm] (水族箱), and dropped the iPod in the tank (水槽). After it touched bottom, bubbles floated to the top. “Those are air bubbles,” he snapped (厉声说道). “That means there’s space in there. Make it smaller.”





prototype ['prəʊtətaɪp]

n. 原型；标准，模范

1. When engineers working on the very first iPod completed the prototype, they presented their work to Steve Jobs for his approval.
2. Metal-wheeled chariots ['tʃærɪət] (战车) are the prototype of the tanks of modern warfare.

Jobs and Buddhism (佛教)

Jobs' 1974 trip to India sparked an interest in Buddhism ['budɪzəm], that stayed with him for the rest of his life.

Early in his stay, Steve had been flirting with 不认真的考慮 ***the idea of being sadhu ['sa:dʊ:]*** (圣人). But Steve was obviously too hungry, too driven, and too ambitious for that kind of life.

His interests then migrated toward Buddhism. Buddhism made him feel justified (有理由的) in constantly demanding nothing less than what he deemed to be “perfection” from others, from the products he would create, and from himself.



Jobs and jobs

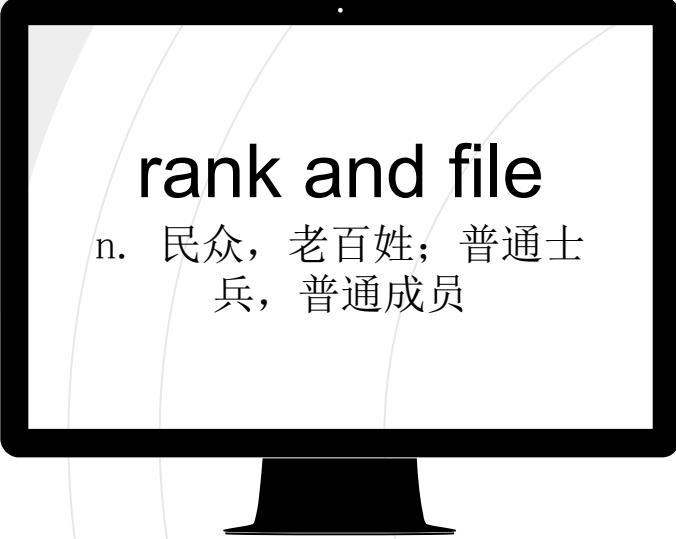
"What have you done for Apple lately?"

Everyone who has worked in the valley has heard this bit of folklore (传闻), over and over, again -- Jobs firing employee/s in the elevator.

Still, the Apple rank-and-file 普通员工 remained fearful of the Bad Steve persona (个性). Word got around about Steve going into meetings, saying, "This is shit," and firing people on the spot.

People worried about getting trapped with him in an elevator for a few seconds, afraid that they might not have a job when the doors opened.





rank and file

n. 民众，老百姓；普通士兵，普通成员

1. Still, the Apple rank-and-file remained fearful of the Bad Steve persona.
2. The biggest difference between the rank-and-file and the leadership involves diplomacy 外交, and psychology 心理.
3. They formed the rank and file of the republican armies (组成共和国军队) in England against the rule of the king.

Steve Jobs: stay hungry, stay foolish

By Steve Jobs, delivered on June 12, 2015

科技主题汇报

大家即刻开始自由组队，每组**4-5**名同学
下次课前组队完毕，填在助教发的共享文档中
时间：第一组同学第三次课汇报
内容：三选一（科技奖项、最新技术、科技公司）
形式：20分钟，展示ppt进行汇报



Thanks!

Any questions?