

云智未来<sup>9th</sup>

第九届中国系统架构师大会  
SYSTEM ARCHITECT CONFERENCE CHINA 2017

# 人工智能助力新时代K12教育

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SACC  
2017

北京·新云南皇冠假日酒店

IT168.com

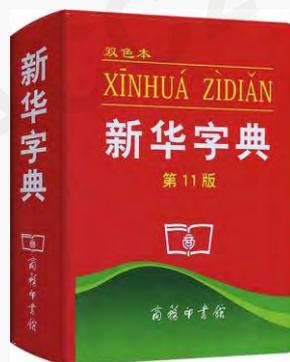
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ITPUB

# 教育是什么？

“培养新生一代准备从事社会生活的整个过程，主要是指学校对儿童、少年、青年进行培养的过程。”

- 新华字典



# 教育是什么？

“教育不能创造什么，但它能启发儿童创造力以从事于创造工作。”

- 陶行知



# 教育是什么？

“在中国，教育一直是一个狭隘的概念，我们一直认为教育就是教学生认字，教学生做数学题，学习科学知识。但是实际上教育最重要的是培养学生正确的价值体系和人格、人力。”

- 俞敏洪

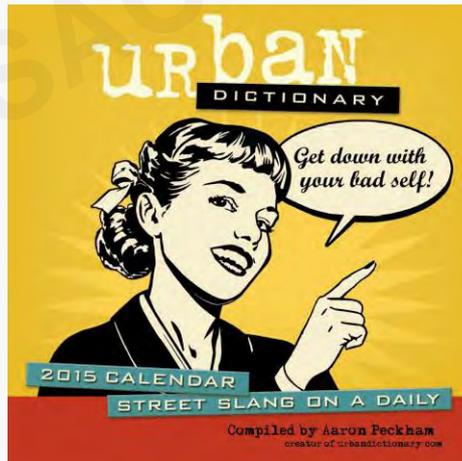


# 教育是什么？

“A way to keep children busy and to deprive them of a childhood.”

(让孩子们一直忙着并且失去童年)

- Urban Dictionary



# 教育是什么？

教育是



教育是什么

教育是立国之本

教育是

教育是什麼

教育是翻身的机会

教育是什么意思

教育是翻身的机会 作文

教育是人類升沉的樞紐 英文

教育是為未來生活做準備

教育是哲學的實驗室

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# K12教育

- K12: kindergaten through grade-12 , 广泛用于美国基础教育系统
- K12 in China : 小初高

SACC2017

# 老师的烦恼



- 55%的时间是重复性的，非教学、教研相关的
  - 组织作业、批改作业
  - 简单复述课本中的知识
  - 职称评定
  - ...

# 学生的烦恼



- 功课太重，压力太大
  - 作业太多
  - 缺乏针对性指导
  - 虎妈、虎爸、虎爷爷、虎奶奶
  - ...

# K12教育的困境

大众的期望



老师看学生



学生看老师



冰冷的现实



# 如何帮助老师？

55%的时间是重复性的



# 如何帮助老师？

- 以一次英语口语作业为例
  - 1个学生读3分钟英语
  - 1个老师教2个班级
  - 1个班级50个学生
  - 老师检查时间:  $2 * 50 * 3 = 300$ 分钟 ( 5小时 )

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# 如何帮助老师？

批改一次作业要5个小时！！！！



# 如何帮助老师？

- 目标：解放老师40-50%的时间
- 方法：应用人工智能技术
  - 语音识别、自然语言处理、图像识别 ...

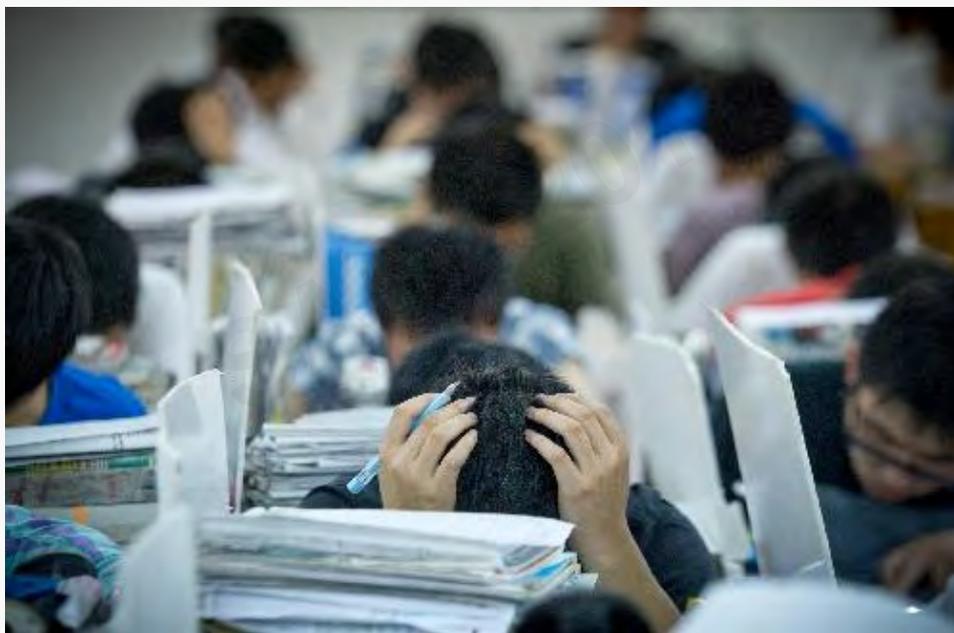


# 如何帮助学生？

26.4%的学生每天作业耗时2小时

44.9%的学生每天作业耗时3小时

28.7%的学生每天作业耗时4小时



# 如何帮助学生？

- 以一次英语作业为例
  - 预习第10课
  - 背诵第9课
  - 背第8、9课新单词
  - 家长检查孩子朗读情况
  - 家长检查单词掌握情况
  - ...



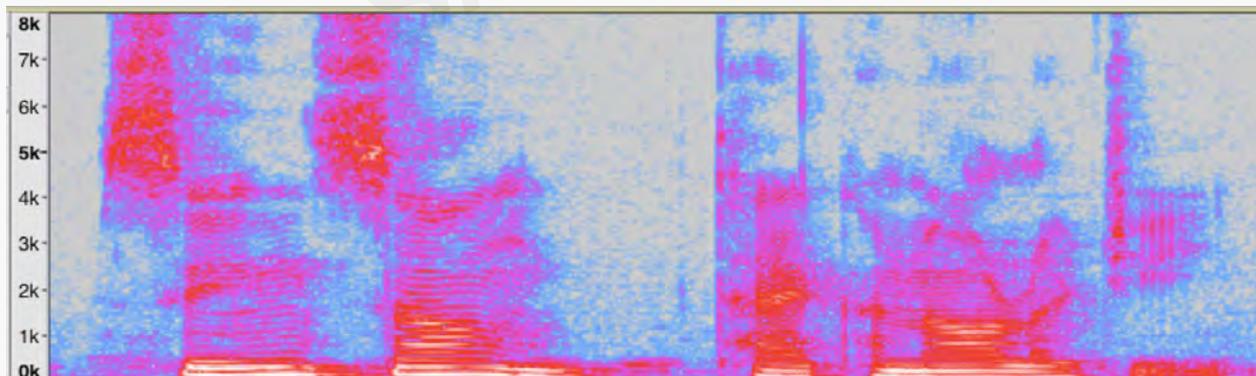
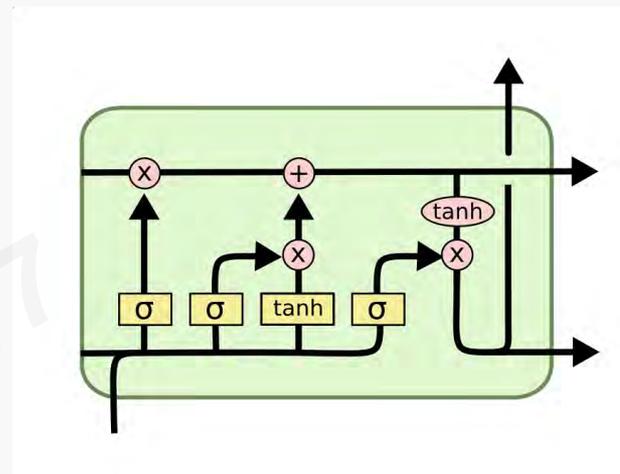
# 如何帮助学生？

- 目标：提高学生学习效率
- 方法：应用人工智能技术
  - 语音识别、自适应学习、情感计算 ...



# 智能批改-英语口语

- 智能口语测评
  - 语音识别 ( LSTM ) 提取特征
  - 语音测评 ( LR、SVM、NN ) 估计打分
  - 实时精准反馈



# 先声教育口语测评技术

## 评测结果

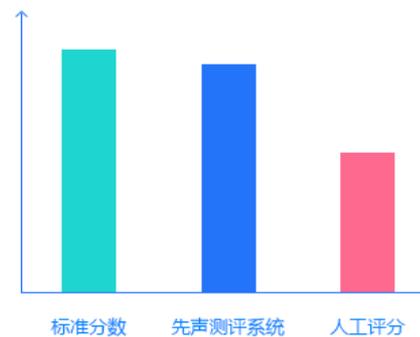
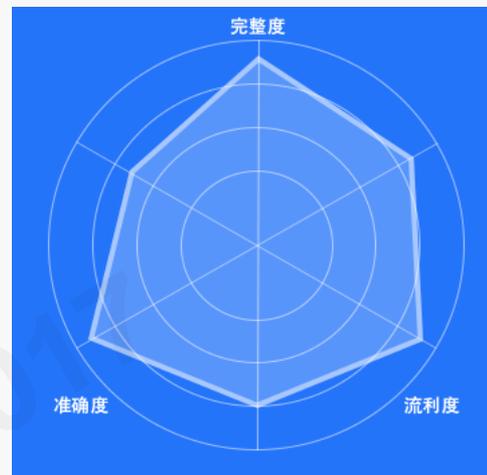
81分

My name is ... David, what is your name? ↑

完整度：89  
遗漏词汇：David  
复读词汇：what

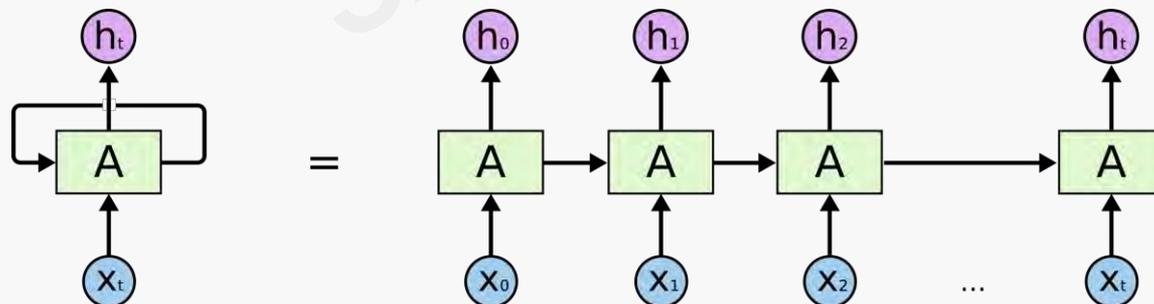
准确度：92  
句子语调：升调

流利度：73  
平均语速：较慢  
停顿过长：1次



# 智能批改-英语作文

- 智能写作批改
  - 特征：Word embedding
  - 模型：Convolutional Layer + LSTM + Linear Layer with Sigmoid activation
  - 语法检错：Rule-based, classifier-based, MT-based methods



# 先声教育写作批改技术



拼写错误

正确答案：diagnosed

What is genetic risk? Genetic risk refers **more** to your chance of inheriting a disorder or disease. People get certain **disease** because of genetic changes. How much a genetic change tells us about your chance of developing a disorder is not always clear. If your genetic results indicate that you have gene changes associated with an increased risk of heart disease, it does not mean that you **definitely will** develop heart disease. The opposite is also true. If your genetic results show that you do not have changes associated with an increased risk of heart disease, it is still possible that you **develop** (will develop) heart disease. However, for some rare diseases, people who have certain gene changes are guaranteed to develop the disease.

When we are **diagnosed** with certain genetic **diseases**, are we **suppose** to disclose this result to our relatives? My answer is no.

On one hand, we do not want this potential danger **causing** frightening effects in our families' later lives. When people around us know that we **got** certain **disease**, their **attitudes** will be **easily changed**, whether caring us too much or keeping away from us. And both are not what we want, since most of us just want to live as a normal people. Surrounded by such concerns, it is very..

# 智能批改-数学作业

- 拍照搜题
  - OCR + Search
- 批改 / 解答
  - Image recognition / Crowdsourcing



# 自适应学习

## Traditional Learning



What Instructors Do

- Find content
- Organize content
- Edit content
- Respond to students



What Students Do

- Everyone gets the same content
- If you miss a concept you are left behind
- Everyone moves at the same pace

## Adaptive Learning



What Instructors Do

- Decide what to teach
- Coach, manage and engage students



What Adaptive Tech Does

- Finds best content
- Links concepts to content
- Adjusts based on content and student success



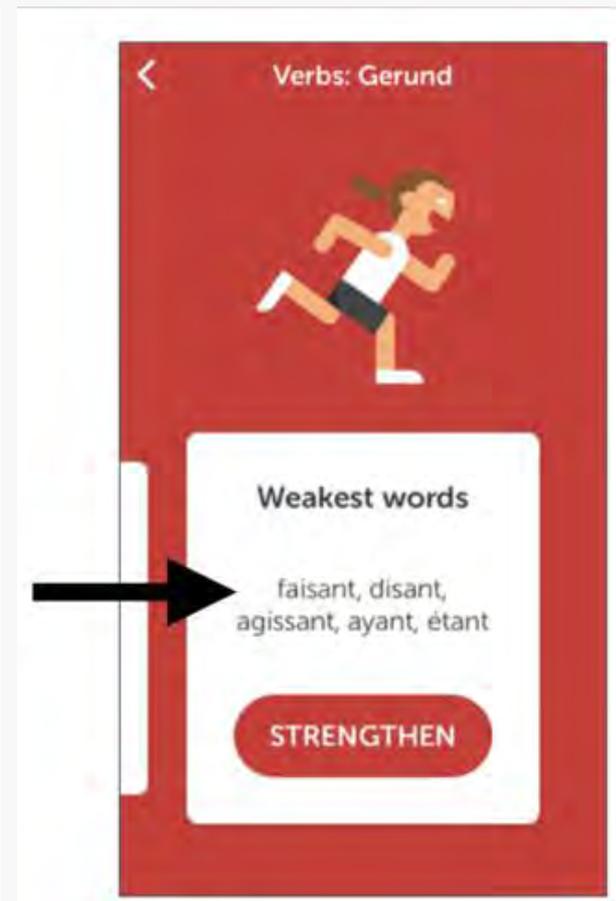
What Students Do

- Get a learning plan just for them
- Skip concepts they know
- Get recommendations
- Master all concepts

Avatars Designed by Freepik

# Duolingo Adaptive Learning

carne	Noun	8 months ago	
salsa	Noun	8 months ago	
desayuno	Noun	8 months ago	
sus	Determiner	9 months ago	
tus	Determiner	9 months ago	
nuestro	Determiner	9 months ago	
mi	Determiner	9 months ago	
tu	Determiner	9 months ago	
baño	Noun	9 months ago	

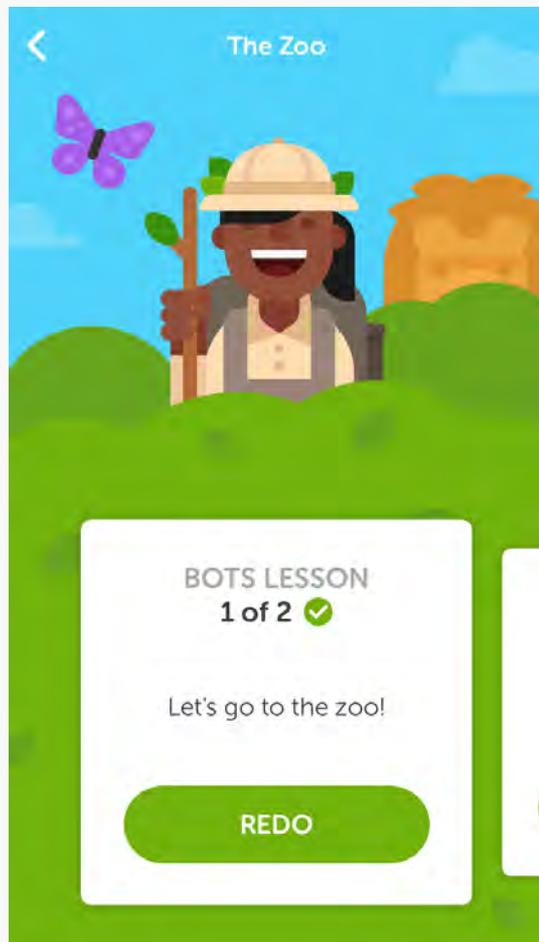


# 对话机器人

- The best way to learn a language is to speak it!
  - To whom?

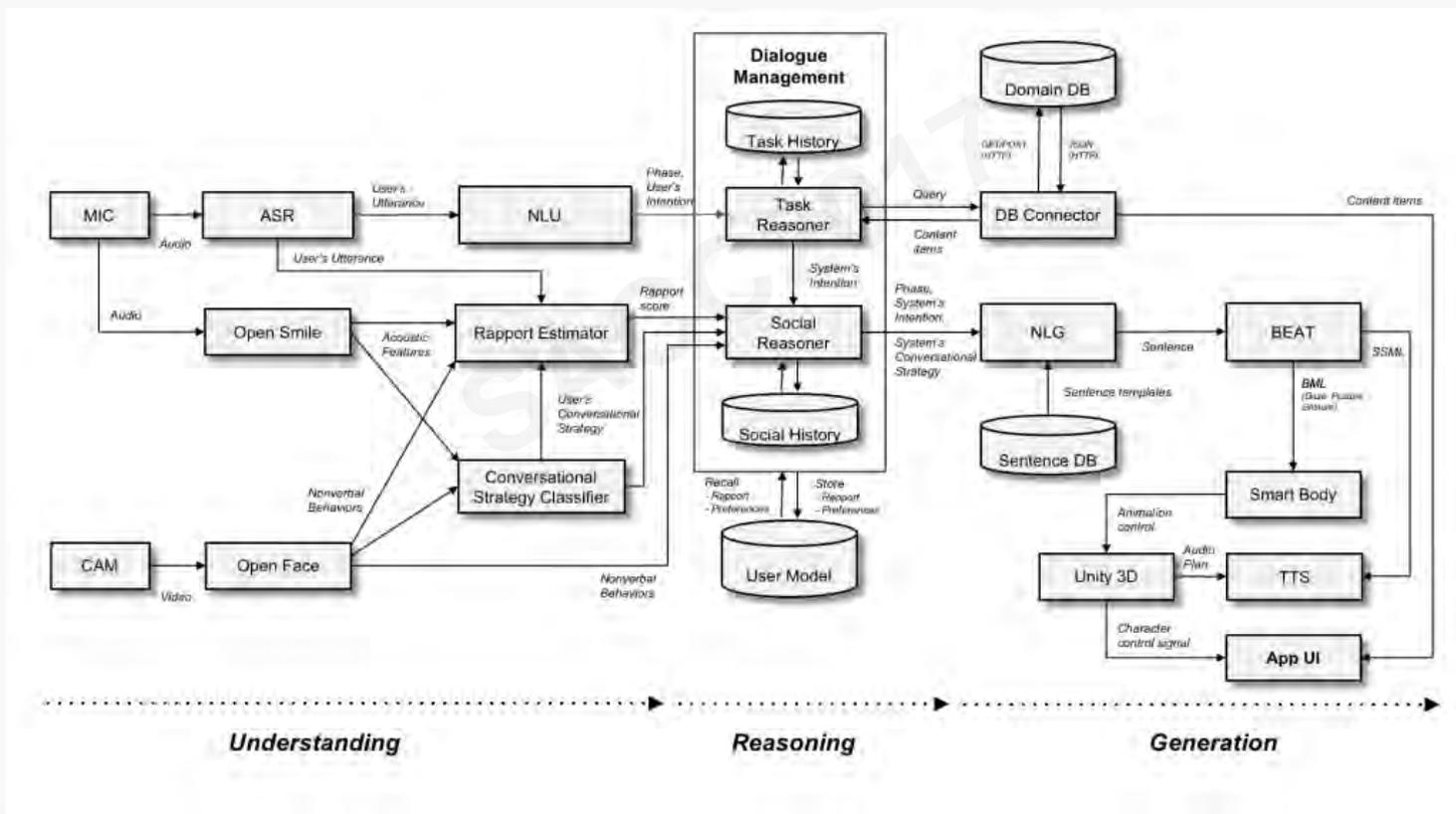


# Duolingo Chatbot

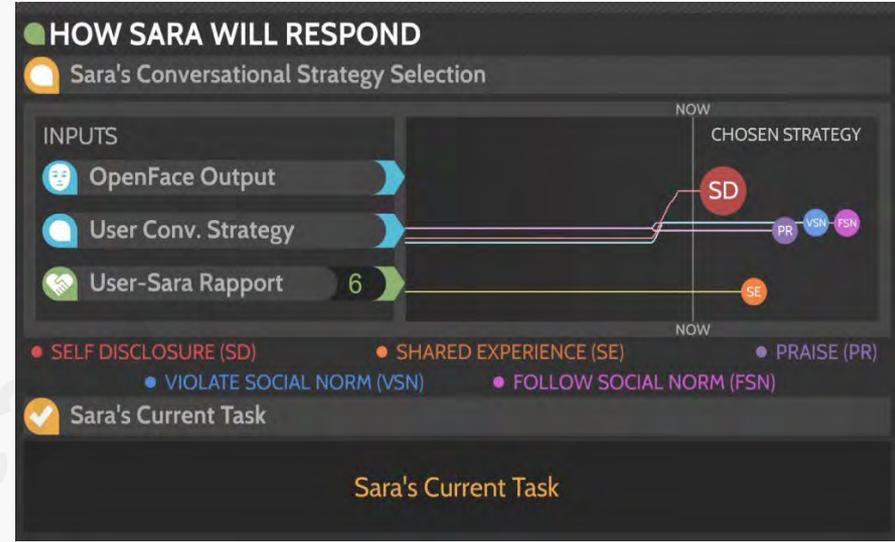
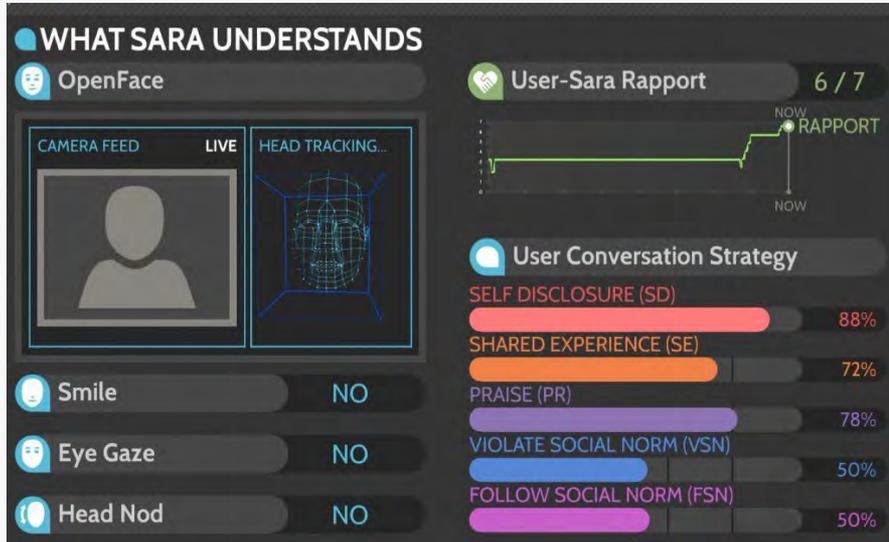


# 情感计算

- 挖掘隐藏于图像、语音信号和文字中的情感信息
- 根据情感和心理学评估实时调整学习计划



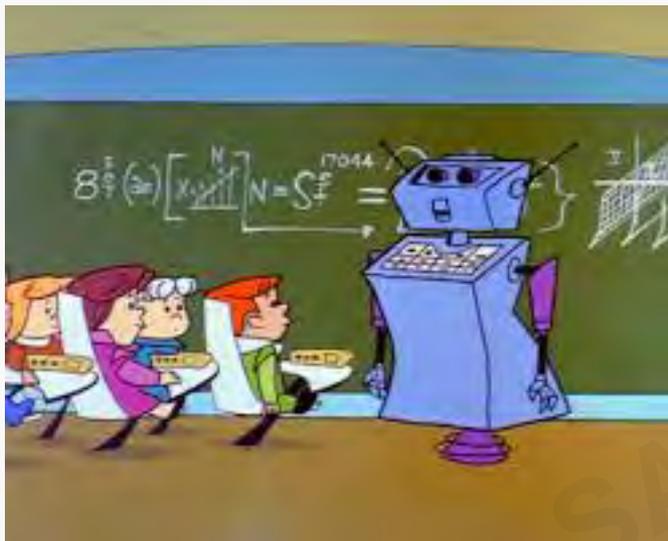
# CMU SARA: the Socially Aware Robot Assistant



# More AI Edtech

- 音乐笔记：
  - 钢琴练测评，音高、节奏等纠错
- Zepp：
  - 智能硬件，高尔夫、棒球、网球等，数据分析，与专业球员对比，技术指导
- 国务院
  - 国务院印发《新一代人工智能发展规划》，明确指出人工智能成为国际竞争的新焦点，应逐步开展全民智能教育项目，在中小学阶段设置**人工智能**相关课程、逐步推广**编程教育**、建设人工智能学科，培养复合型人才，形成我国人工智能人才高地。

# 智能教育的未来 = AI老师？



# 智能教育的未来 = AI+老师



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# Democratizing AI

- 59.9%的家庭收入在3-12万
  - 绝大多数家庭无法承担线下培训/线上直播
- 通过人工智能技术
  - 降低获取知识的成本
  - 提高获取知识的效率

THANKS

The background features a dark, almost black, space filled with numerous small, bright blue particles. These particles are arranged in several distinct, curved paths that sweep across the frame from the bottom left towards the top right. A bright, white-to-blue gradient light source is positioned behind the word 'THANKS', creating a lens flare effect that illuminates the surrounding particles and the text itself.