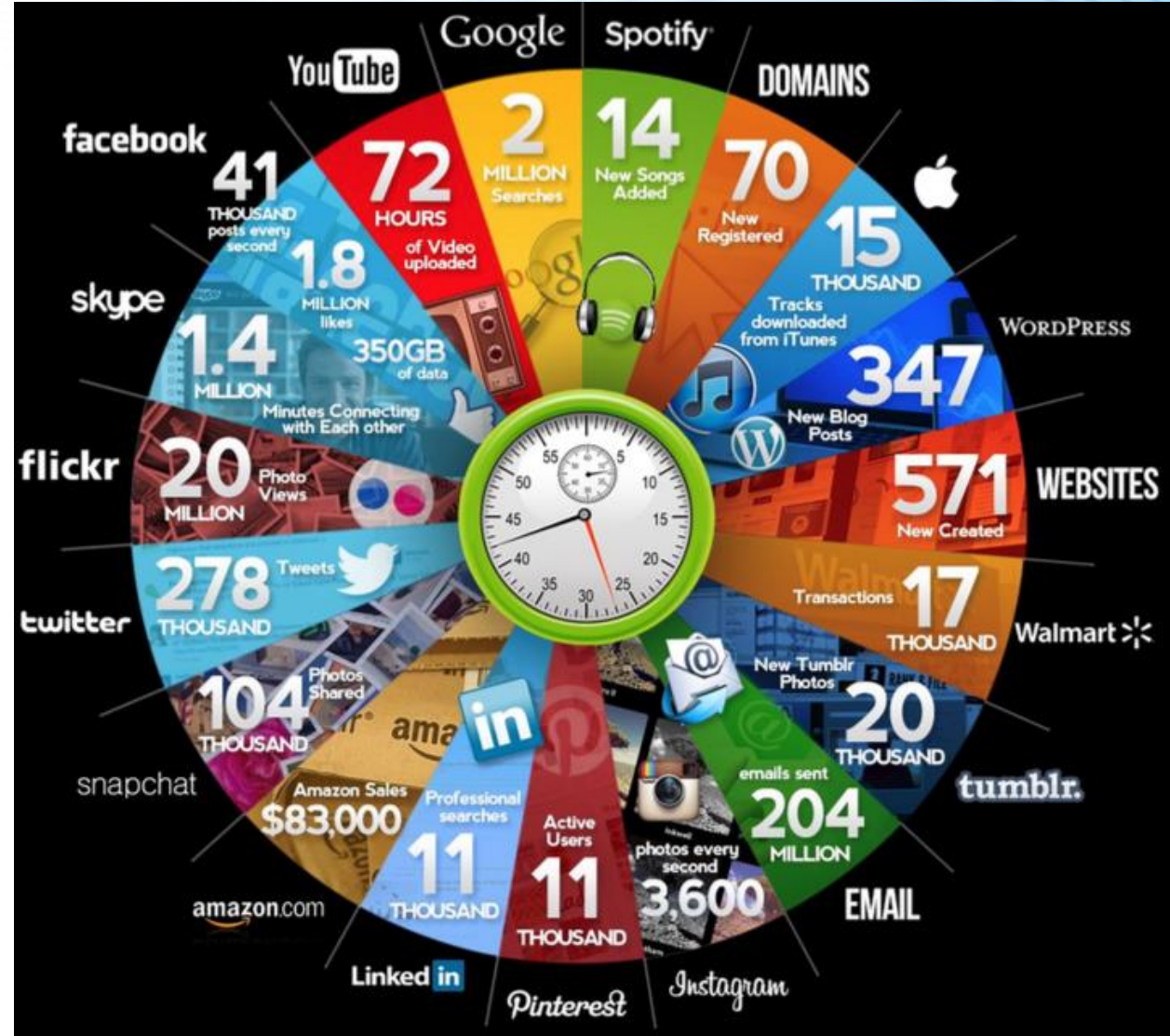


# AI加持心理测评助力企业人才选拔

北京师范大学心理学部 骆方

- 什么是人工智能？
- 人才测评面临的挑战
- AI 有望助力人才测评突破瓶颈
  - 可以采集自然状态下数据
  - 助力新型测评工具研制



# 什么是人工智能？



# 人才测评面临的挑战

新新  
时时要  
代求

综合  
素质



德

才

人格

能力

态度

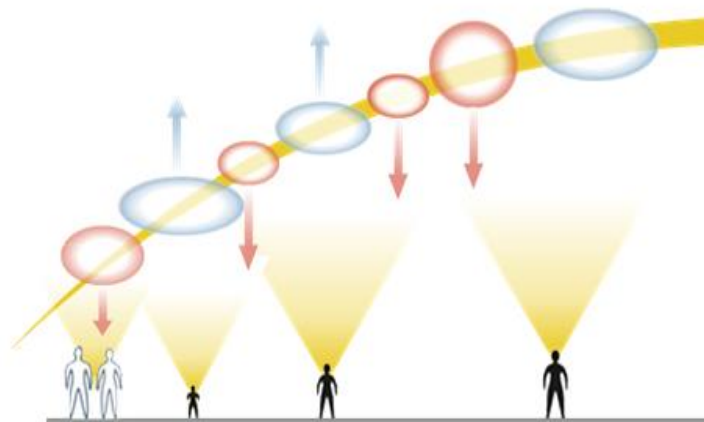
## 新挑战

- 高阶思维、问题解决、创新能力缺乏有效的测评
- 情绪调控、合作性、态度、兴趣、健全人格缺乏有效的测评
- 缺少对一个“完人”的有效测评

# 人才测评面临的挑战

新新  
时代  
要求

注重  
过程

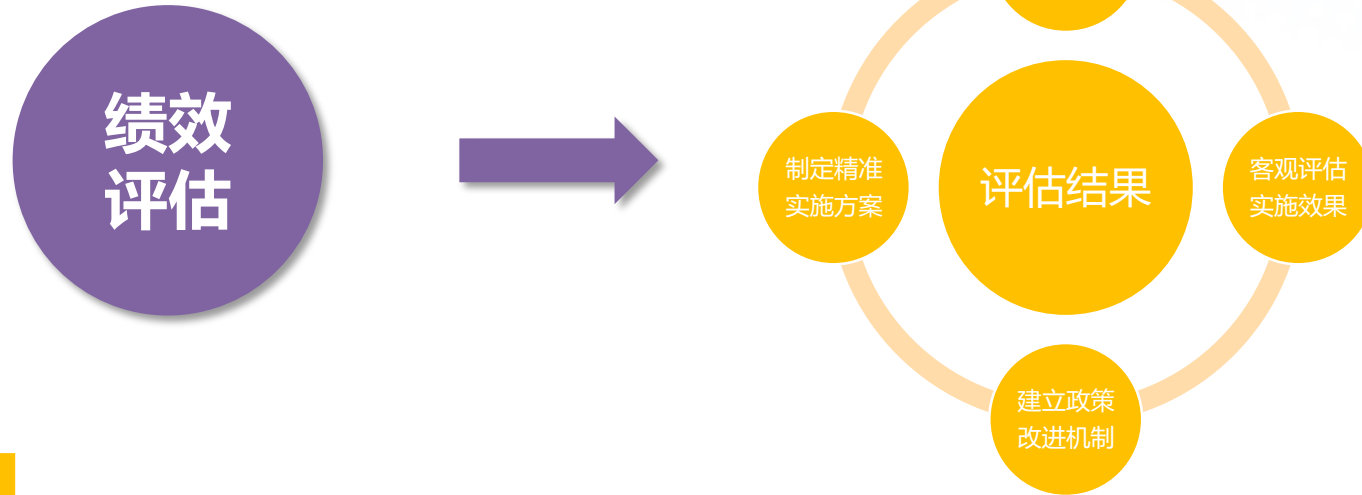


## 新挑战

- 注重终结性评价，忽视过程性评价
- 难以对过程性信息进行采集、存储、追踪
- 改进缺乏足够的技术支持

# 人才测评面临的挑战

新新  
时时要  
代求



## 新挑战

- 影响个体发展的环境复杂多样，传统评价方法对这些复杂因素及其动态变化的把握存在困难。

数据采集

传输存储

数据分析

可视化应用

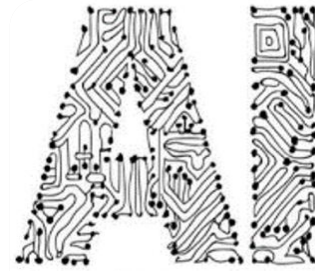
科技新进展与新机遇



可穿戴设备



5G、物联网

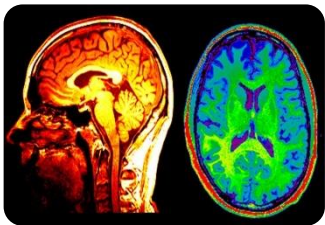


ARTIFICIAL INTELLIGENCE

人工智能



可视化技术



脑成像技术



云计算、大数据



AR/VR

# 全面采集自然状态下的多模态数据助力人才选拔



可穿戴设备



点阵纸笔：学习轨迹的采集



AR/VR

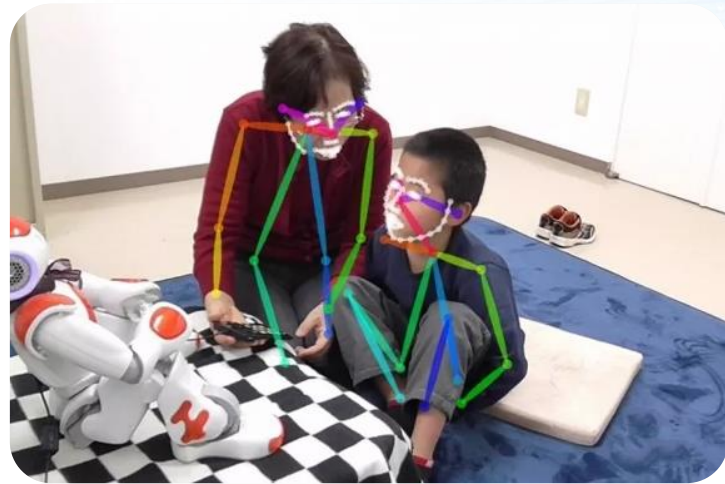


网络痕迹数据



视音频数据





## 情绪识别与情感测评

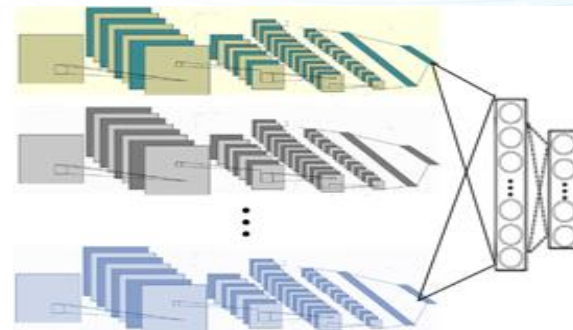
- 以深度学习、增强学习、迁移学习为支撑，探索文本分析、语音分析、图像识别、血谱成像应用，实现对个体情绪特征的识别与判断。

# 在线数据动态挖掘

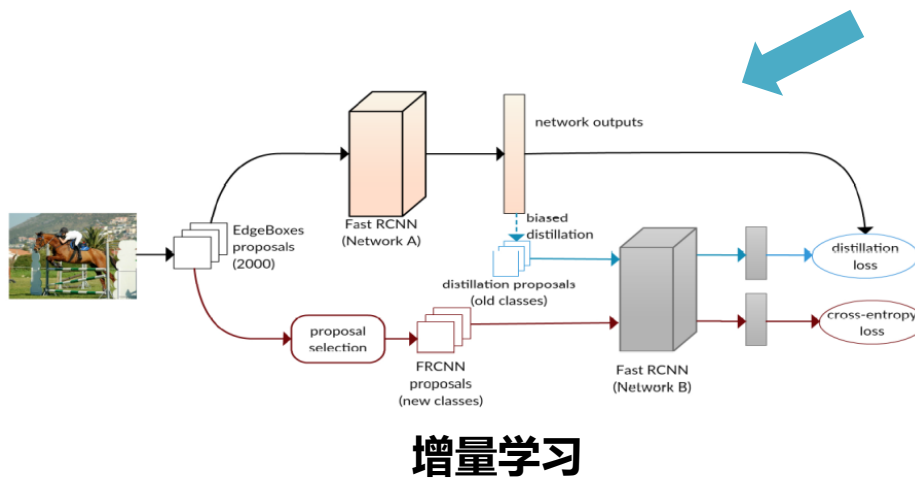
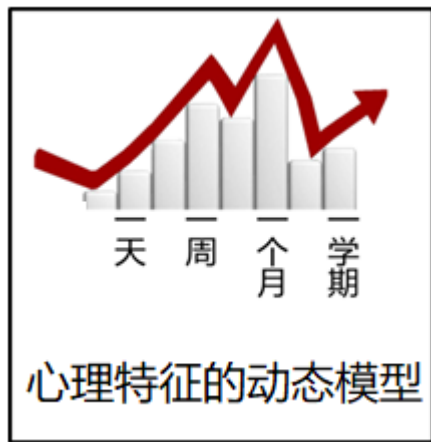
### 网络痕迹数据

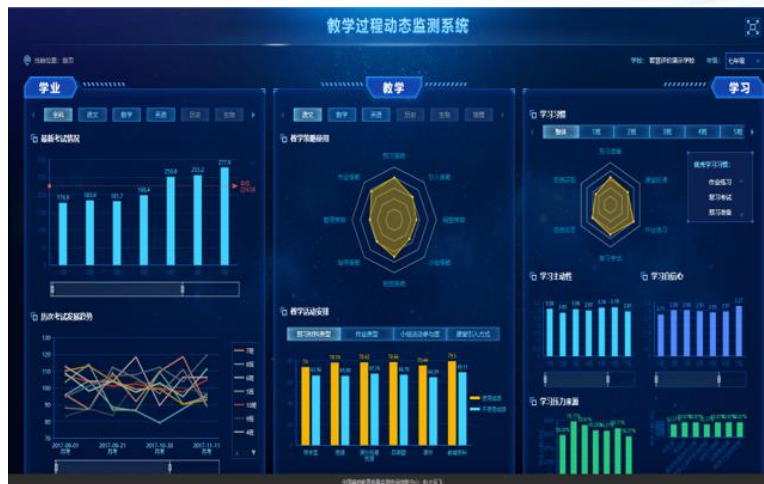
- 培训活动 • 社交娱乐
- 学习记录 • 话题评论
- 交流互动 • 日常聊天
- 培训效果 • 资讯浏览
- ..... • .....

- 文本
- 音频
- 视频



多源卷积神经网络





## 工作场景/面试互动模式的精准刻画

- 真实情景、实时动态、维度多，有利于高效决策、精准治理、有效改进

1

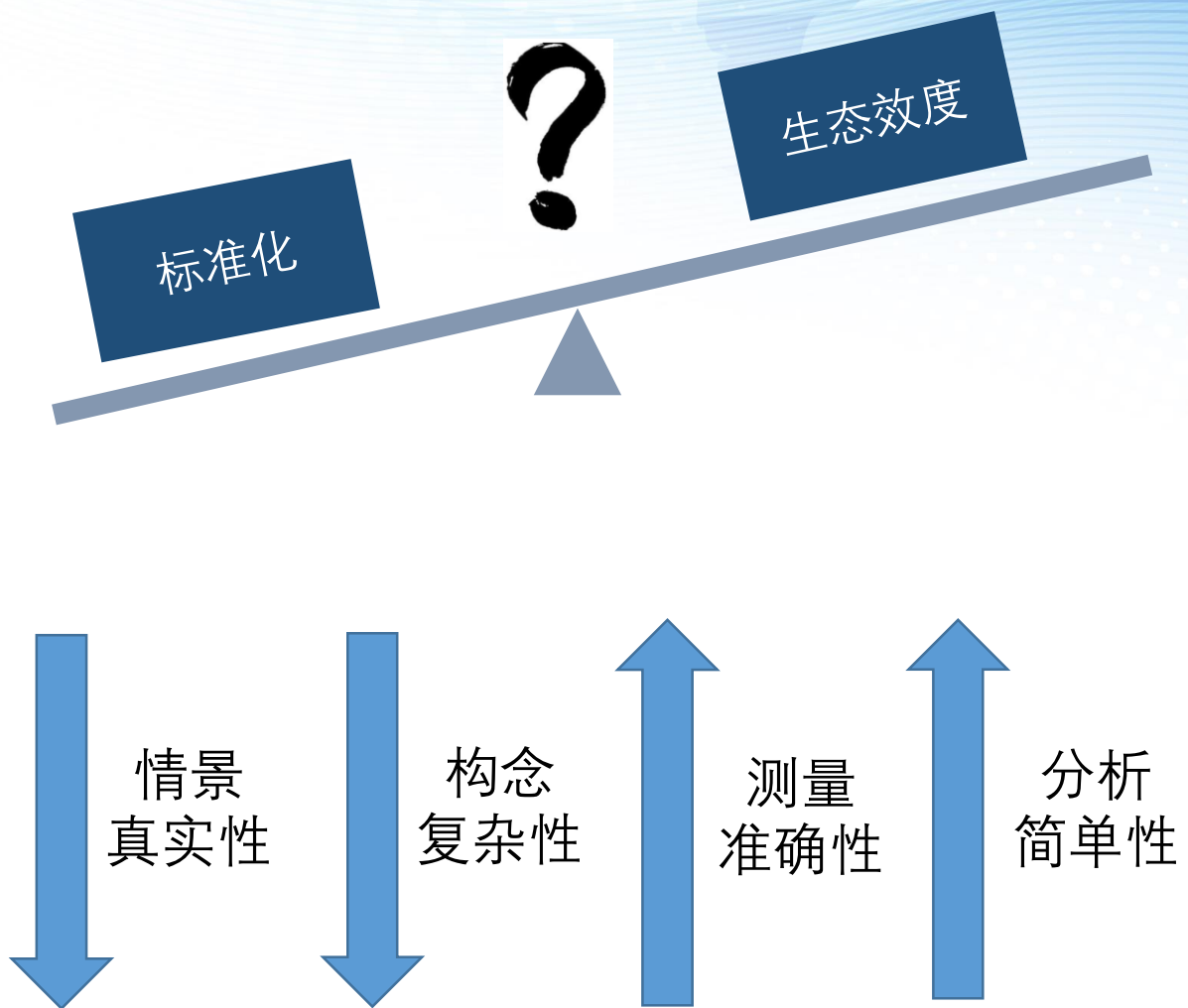
• 计算机交互式测评

2

• 虚拟动态情景测评

3

• 自然状态数据+测评



AI  
助力  
研制  
新型  
测评  
工具

## 问题解决能力：计算机交互式测评

The screenshot shows a software interface for an interactive assessment. At the top, it displays 'Creature 11 of 12', the name 'Capitis intelligentius', and a timer 'You have 21 minute(s) left.'. Below this is a navigation bar with 'To the database' and 'Investigate the creature' buttons, and a 'Help' icon. A 'Calendar' widget shows a 2x5 grid of days (1-10). A 'Next day' button is positioned to the right of the calendar. The main area features a central cartoon character of a yellow creature with a grey rock on its head. To the left of the character are three red control panels, each with 'on' and 'off' buttons and a circular icon containing a DNA helix. Each panel is associated with a line graph showing data over 10 days. To the right of the character are three computer monitors displaying line graphs and numerical scores: 'IQ' with a score of 50, 'Inventions' with a score of 30, and 'Great ideas' with a score of 40.

# Operation ARA

## 故事线


拯救地球——外星人入侵地球，对人类进行疯狂洗脑，发布谣言混淆视听，让人类丧失科学思维。

玩家需要应用科学推理，识别外星人。


## 目标

培养大众理性面对纷繁的研究，能够在日常生活与交往中应用科学思维及原则。

Operation ARA
PROVING GROUND
CASE 1 OF 11
FUATH FIELD GUIDE



Dr. Quinn




Broth

*Dr. Quinn:* OK. Let us start.


*Dr. Quinn:* This study investigates how the acidity of a fish's environment influences its growth.

*Broth:* Please enter a flaw or press the "no more flaws" button if you can't find any more flaws.



Tracy

0



Pearson

0

**ACID RAIN** +

**Acid Rain, Anyone?**

An environmental student group decided to determine the effects of water pH levels on fish populations. Frequent acid rain, for example, can lead to lower pH levels (or higher acidity) in bodies of water over time, and it is speculated that the pH level has numerous effects on fish. It is believed that pH levels can affect the size of fish as well as the different food sources that are available in a particular body of water, which can have an effect on which fish species can survive as water acidity changes. For example, it seems that algae develop more often in waters with higher pH (lower acidity) levels, while small fish are more abundant in lakes with lower pH levels (higher acidity).

The environmental group hired a chemist to conduct research on the effects of the pH levels to address the issue of greater acid rain exposure. The chemist

AI  
助力  
研制  
新型  
测评  
工具

## 用到了哪些AI技术?

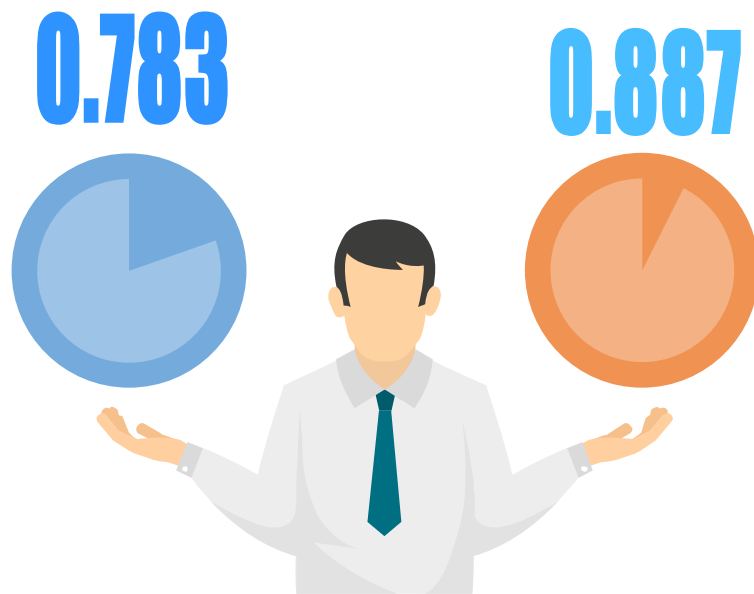
### 语音识别技术



### 图像识别技术



### 自然语言处理：自动化评分



编码者相关V.S.人机相关





<https://www.game-learn.com/game-based-learning-corporate-training/serious-game-in-leadership-and-team-management/>

“played with a computer in accordance with specific rules, that considers entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives” (Zyda, 2005).

## 虚拟动态情景测评

**严肃游戏**

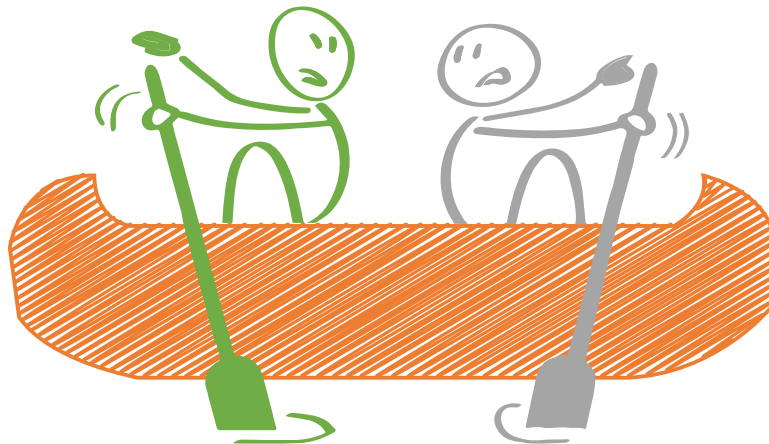
游戏的主要目标，可以不仅是娱乐

# 游戏式测评 —— 优势

纸笔测验等传统测量方法的局限性日益凸显：高度结构化、任务去背景化，测量的知识过于表面化，无法有效测量更加深层的认知过程和高级思维能力（Shute, 2009）。

## 游戏测评

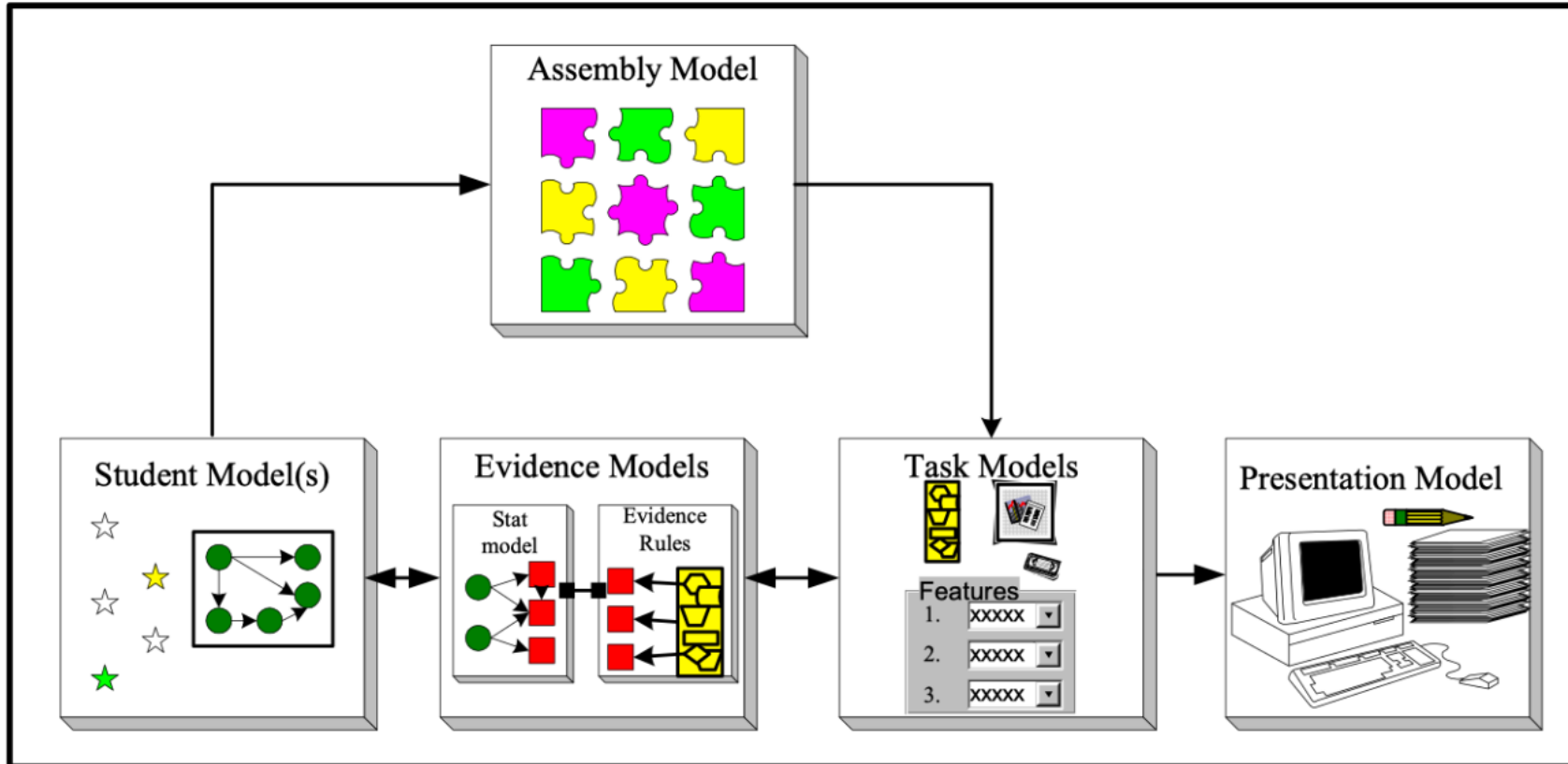
- 真实的游戏情境
- 激发个体的积极性
- 可收集过程性数据
- 测验隐蔽性高
- 测验有效性高



## 传统测评

- 测验情境不真实
- 测验高度结构化
- 考察的知识表面化
- 测验形式枯燥

# 以证据为中心的设计：控制测量误差



(Mislevy, Sternberg, & Almond, 2003)

# 探索过程数据在游戏测评中的应用



```
JCreator
logo
File Edit View Project Build Run Tools Configure Window Help
Vp007g_Test_g_01_Chemie_c_Ch...
<variable name="Dehnbarkeit" userDefinedId="EndoB" value="50"/>
<variable name="Transparenz" userDefinedId="EndoC" value="54"/>
<variable name="Stradium" userDefinedId="ExoB" value="0"/>
<variable name="Melium" userDefinedId="ExoC" value="0"/>
<variable name="Ladium" userDefinedId="ExoA" value="0"/>
</logEntry>
</logEntry>
<logEntry xsi:type="cbaloggingmodel:LogEntryTimeStamp" timeStamp="2011-06-23T12:29:09.859+0200">
  <logEntry xsi:type="cbaloggingmodel:SelectedPanelLogEntry" id="Scenario"/>
</logEntry>
<logEntry xsi:type="cbaloggingmodel:LogEntryTimeStamp" timeStamp="2011-06-23T12:29:14.843+0200">
  <logEntry xsi:type="cbaloggingmodel:MicroDynButtonPressLogEntry" button="Execute" phase="simple exploration">
    <variable name="HÄrte" userDefinedId="EndoA" value="58"/>
    <variable name="Dehnbarkeit" userDefinedId="EndoB" value="54"/>
    <variable name="Transparenz" userDefinedId="EndoC" value="58"/>
    <variable name="Stradium" userDefinedId="ExoB" value="2"/>
    <variable name="Melium" userDefinedId="ExoC" value="0"/>
    <variable name="Ladium" userDefinedId="ExoA" value="0"/>
  </logEntry>
</logEntry>
<logEntry xsi:type="cbaloggingmodel:LogEntryTimeStamp" timeStamp="2011-06-23T12:29:19.140+0200">
  <logEntry xsi:type="cbaloggingmodel:MicroDynButtonPressLogEntry" button="Execute" phase="simple exploration">
    <variable name="HÄrte" userDefinedId="EndoA" value="58"/>
    <variable name="Dehnbarkeit" userDefinedId="EndoB" value="54"/>
    <variable name="Transparenz" userDefinedId="EndoC" value="58"/>
    <variable name="Stradium" userDefinedId="ExoB" value="0"/>
    <variable name="Melium" userDefinedId="ExoC" value="0"/>
    <variable name="Ladium" userDefinedId="ExoA" value="0"/>
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</logEntry>
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  <logEntry xsi:type="cbaloggingmodel:MicroDynButtonPressLogEntry" button="Execute" phase="simple exploration">
    <variable name="HÄrte" userDefinedId="EndoA" value="58"/>
    <variable name="Dehnbarkeit" userDefinedId="EndoB" value="58"/>
    <variable name="Transparenz" userDefinedId="EndoC" value="62"/>
    <variable name="Stradium" userDefinedId="ExoB" value="0"/>
    <variable name="Melium" userDefinedId="ExoC" value="2"/>
  </logEntry>
</logEntry>
```

## 每一次点击-事件-时间

过程数据：

学生ID

项目ID

当前事件

操作行为

对应时间点

studentId	eventCou	itemId	event_name	target	id	lang	time
840-51-01-003-00025	0	CS633Q00	onItemBegin	MODULE		eng-USA	1397193846084
840-51-01-003-00025	1	CS633Q00	stimulusLoaded	MODULE		eng-USA	1397193846545
840-51-01-003-00025	2	CS633Q00	QuestionLoaded	MODULE		eng-USA	1397193846570
840-51-01-003-00025	3	CS633Q00	StimulusAndQuestionLoa	MODULE		eng-USA	1397193846570
840-51-01-003-00025	4	CS633Q00	onItemEnd	MODULE		eng-USA	1397193850305
840-51-01-003-00025	5	CS633Q000	click	li	next	eng-USA	1397193851030
840-51-01-003-00025	6	CS633Q000	onItemBegin	MODULE		eng-USA	1397193851104
840-51-01-003-00025	7	CS633Q000	QuestionLoaded	MODULE		eng-USA	1397193851283
840-51-01-003-00025	8	CS633Q000	stimulusLoaded	MODULE		eng-USA	1397193851427
840-51-01-003-00025	9	CS633Q000	StimulusAndQuestionLoa	MODULE		eng-USA	1397193851427
840-51-01-003-00025	10	CS633Q000	click	div	roof-color	eng-USA	1397193854737
840-51-01-003-00025	11	CS633Q000	click	span	stimulus_13	eng-USA	1397193855055
840-51-01-003-00025	12	CS633Q000	click	input	roofColorRadioRed	eng-USA	1397193855061

结果数据：该题（任务）作答结果

## 如何从过程数据中获得有效特征?

- 特征提取问题
- 特征选择问题
- 特征重组问题
- .....



## 如何利用过程数据实现有意义的分析?

- 提升心理测量的有效性
- 如何帮助验证理论假设
- 提供更多策略上的分析
- .....

谢 谢!