人机交互

课程简介

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2023年

课程简介

- 人机交互课程是计算机科学交叉领域中**创建与评估可用及有用的可计算产品所涉及到的基本问题**的一门重要的学科专业课。
  - 通过**以用户为中心**的设计和评估，根据**用户需求**进行设计，并通过用户的使用对设计进行验证。
  - 通过课程讲座、指定阅读的材料和课程项目设计，同学们将以组队的形式，**为现实世界的问题设计一个解决方案**，课程的一个实际输出是一个高保真的**交互系统原型**，旨在解决特定的现实世界问题。

课程教学目标

- **知识认知能力**
  - 理解**人机交互研究领域基本概念与方法论**，理解**人机交互应用基础与趋势**。
  - 确定系统目标用户，设计研究以了解目标用及其在社会文化背景下的需求。
  - 通过不同的**设计活动**，使用多种方法设计交互式系统。
    - 使用数字化及物理化工具，**快速实现一个高保真的交互式系统的原型**；
    - 在**开发的不同阶段**对设计进行评估；
    - 通过**用户实验**去衡量一个交互式系统；
    - 正确**收集和分析**探索性用户研究中的**定性和定量数据**，包括现场观察、半结构化访谈、原型评估、案例分析、启发式评估和认知评估等。

课程教学目标

- **综合素质能力**
  - 具备科学精神和工程师的基本素养，具备科技报国的**家国情怀和使命担当**；
  - 能进行**团队协作**，具备合作精神和**人际沟通**能力；
  - 能和目标用户及学术界工业界相关涉及方进行有效的沟通与交流

课程教学方法

- **课堂教学**：人机交互课程知识点基本以（双语）课堂教学为主，在讲解基本知识点和各课题的基础上，关注课程重点难点内容的讲授，采用启发式教学方法，引导学生对问题展开思考和讨 论，使学生对人机交互的基本概念与方法论、应用基础与趋势、以人为本的设计思维与原型设计及评测等有清晰的认知。
- **课堂演讲**：学生通过从人机交互领域的相关文献中选择一篇与指定课题有关的文献进行 **conference-style 的演讲**，梳理论文中人机交互因素，加深知识的理解。
- **课堂项目报告**：学生需要从课程初期进行组队选题，从理解目标用户、需求分析、原型设计及实现、系统评测、视频宣传及最终汇报，**完成一个以人为本的人机交互系统全流程**，解决现实世界的问题

Recognition of HCI in Academia

Top Conferences for General Computer Science

*Ranking is based on **Conference H5-index>=12** provided by Google Scholar Metrics*

Show **Due** only | All Categories | All Countries | Search by keyword

H5-index	Publisher	Conference Details
240	IEEE	**CVPR : IEEE/CVF Conference on Computer Vision and Pattern Recognition** Jun 16, 2020 - Jun 18, 2020 - Seattle , **United States** http://cvpr2020.thecvf.com/
169	Neural Information Processing Systems Foundation	**NeurIPS : Neural Information Processing Systems (NIPS)** Dec 6, 2020 - Dec 12, 2020 - Vancouver , **Canada** https://nips.cc/Conferences/2020/CallForPapers
135	PMLR	**ICML : International Conference on Machine Learning (ICML)** Jul 12, 2020 - Jul 18, 2020 - Vienna , **Austria** https://icml.cc/Conferences/2020
88		**EMNLP : Conference on Empirical Methods in Natural Language Processing (EMNLP)** Nov 16, 2020 - Nov 20, 2020 - Online , **Online** https://2020.emnlp.org/
87	Association for Computing Machinery	**CHI : Computer Human Interaction (CHI)** May 8, 2021 - May 13, 2021 - Yokohama , **Japan** https://chi2021.acm.org/ **Deadline : Thu 10 Sep 2020**
86	Association for Computing Machinery	**SIGKDD : ACM SIGKDD International Conference on Knowledge discovery and data mining** Aug 22, 2020 - Jan 1, 1970 - San Diego , **United States** https://www.kdd.org/kdd2020/

Accessed in Aug 2020, http://www.guide2research.com/topconf/computer-science

Top Conferences in All Topics

Saliency

All | Past 10 Years | Past 5 Years | Past 1 Year

Filter Conferences

1. CVPR	21. ISSCC	41. ACC	61. CIKM	81. ICME
2. ICRA	22. WWW	42. IAS	62. PESC	82. AeroConf
3. NeurIPS	23. KDD	43. IEDM	63. HiPC	83. FOCS
4. ICASSP	24. ICIP	44. DAC	64. DATE	84. PVSC
5. CHI	25. SIGMOD	45. APEC	65. ATS	85. ECOC
6. ICCV	26. VLDB	46. MOBICOM	66. IJCNN	86. MEMS
7. ICC	27. CLEO	47. HICSS	67. ECTC	87. SIGCSE
8. ICML	28. OFC	48. WCNC	68. ASILOMAR	88. CSCW
9. SIGGRAPH	29. ISCAS	49. IECON	69. EuCAP	89. ADHOCNETS
10. EMBC	30. INTERSPEECH	50. MM	70. SOCO	90. MSE
11. INFOCOM	31. ISIT	51. PES	71. CRYPTO	91. ISAP
12. CDC	32. IMS	52. ICDE	72. ICDM	92. GECCO
13. SIGCOMM	33. ICLR	53. ICPR	73. ISCA	93. COLING
14. ECCV	34. IGARSS	54. PIMRC	74. AAMAS	94. BMVC
15. GLOBECOM	35. EMNLP	55. UbiComp	75. IPDPS	95. EuMC
16. SMC	36. IJCAI	56. ACC	76. LREC	96. DSS
17. AAAI	37. CCS	57. MICCAI	77. CEC	97. NSS
18. VTC	38. ICSE	58. NAACL	78. IUS	98. SOSP
19. IROS	39. SIGIR	59. STOC	79. SODA	99. NSDI
20. ACL	40. S&P	60. IEEEAPS	80. SECURITY	100. MILCOM

Accessed in Aug 2020: https://academic.microsoft.com/conferences/

Top HCI Conference

Categories > Engineering & Computer Science > **Human Computer Interaction**

	Publication	h5-index	h5-median
1.	Computer Human Interaction (CHI)	85	106
2.	ACM Conference on Computer-Supported Cooperative Work & Social Computing	56	78
3.	ACM Conference on Pervasive and Ubiquitous Computing (UbiComp)	50	73
4.	ACM Symposium on User Interface Software and Technology	44	65
5.	IEEE Transactions on Affective Computing	37	75
6.	ACM/IEEE International Conference on Human Robot Interaction	35	52
7.	International Journal of Human-Computer Studies	35	47
8.	ACM Transactions on Computer-Human Interaction (TOCHI)	33	50
9.	Behaviour & Information Technology	32	48
10.	Conference on Designing Interactive Systems	31	42

https://scholar.google.com.hk/citations?view_op=top_venues&hl=en&vq=eng_humancomputerinteraction

中国计算机学会推荐国际学术刊物

(● 人机交互与普适计算)

A类

序号	刊物名称	刊物全称	出版社	地址
1	TOCHI	ACM Transactions on Computer-Human Interaction	ACM	http://dblp.uni-trier.de/db/journals/tochi/
2	IJHCS	International Journal of Human Computer Studies	Elsevier	http://dblp.uni-trier.de/db/journals/ijmms/

A类

序号	刊物名称	刊物全称	出版社	地址
1	CSCW	ACM Conference on Computer Supported Cooperative Work and Social Computing	ACM	http://dblp.uni-trier.de/db/conf/cscw
2	CHI	ACM Conference on Human Factors in Computing Systems	ACM	http://dblp.uni-trier.de/db/conf/chi
3	UbiComp	ACM international joint conference on Pervasive and Ubiquitous Computing	ACM	http://dblp.uni-trier.de/db/conf/huc/
4	UIST	ACM Symposium on User Interface Software and Technology	ACM	http://dblp.uni-trier.de/db/conf/uist/

https://www.ccf.org.cn/Academic_Evaluation/HCIAndPC/

人机交互高校研究的国内外现状

1. 华盛顿大学
2. 卡耐基梅隆大学
3. 多伦多大学

#	Institution	Count	Faculty
1	University of Washington	121.0	36
2	Carnegie Mellon University	118.4	47
3	University of Toronto	67.3	18
4	University of Michigan	49.1	25
5	University College London	44.6	18
6	KAIST	43.3	27
7	Georgia Institute of Technology	42.6	29
8	Stanford University	41.9	19
9	Univ. of California - Irvine	39.3	21
10	University of Melbourne	36.7	17
11	Univ. of California - San Diego	36.1	20
12	Monash University	35.6	13
13	Aalto University	32.1	15
14	Cornell University	31.7	17
15	University of Colorado Boulder	31.6	22
16	Tsinghua University	29.4	13
17	Lancaster University	29.2	15
18	University of Copenhagen	28.2	9
19	University of Nottingham	27.5	14
20	Univ. of California - Berkeley	27.1	17

13. 阿尔托大学

16. 清华大学

Rank institutions in the world by publications from 2011 to 2021

CSRankings: Computer Science Rankings

人机交互高校研究的国内外现状

2. 清华大学

4. 北京大学
5. 香港科技大学

8. 中科院大学

13. 浙江大学

17. 复旦大学

#	Institution	Count	Faculty
1	KAIST	43.3	27
2	Tsinghua University	29.4	13
3	University of Tokyo	25.1	11
4	Peking University	14.1	16
5	HKUST	12.8	10
6	Singapore Management University	12.5	14
7	National Taiwan University	10.7	4
8	Chinese Academy of Sciences	10.4	7
9	University of Tsukuba	9.4	14
10	Nanjing University	8.9	15
10	National University of Singapore	8.9	4
12	Osaka University	8.7	8
13	Zhejiang University	8.2	19
14	National Chiao Tung University	7.8	6
15	Seoul National University	7.7	6
16	Keio University	6.7	7
17	Fudan University	5.8	5
18	IIIT Delhi	5.5	7
19	NWPU	5.4	3
20	Tokyo Institute of Technology	5.1	4

Rank institutions in Asia by publications from 2011 to 2021

CSRankings: Computer Science Rankings

人机交互企业研究的国内外现状

华为

华为人机交互实验室（HMI LAB）隶属于2012实验室，负责华为智能终端和智能座舱等产品形态的人机交互的前沿技术探索、研究和发明，确保相关产品在人机交互方面的核心竞争力，构建华为人机交互核心技术、能力和人才梯队。

1.1 人机交互技术研究工程师

致力于人机交互的技术研究，通过算法提升产品体验和交互效率

预研业界最优秀的手机、智能座舱、可穿戴、平板/PC、智能家居等全品类终端产品的交互技术；结合体验设计，探索技术工程方法，设计软件架构，并快速实现人机交互原型。

1.2 ID与UX设计师-人机交互体验设计师

负责人机交互体验的洞察、规划和设计，为新产品形态和新交互方式的体验和竞争力负责。结合用户研究的结果，设计未来的人机交互体验，协同技术团队交付体验原型并持续打磨。

1.3 ID与UX设计师-人因及用户体验研究员

面向未来的产品形态、业务形态和交互方式，从人因工效学的角度，针对性构建评价方法、设计实验，并能够得出人机交互的标准和模型。

1.4 座舱交互研究员

负责智能座舱人机交互架构和功能设计，包括使用场景、交互设计、交互技术、用户测试和研究、人因研究等内容，进行智能座舱领域的设计探索和验证。

以安全、高效为目标，建立座舱交互的评估模型、工具和仿真环境；设计创新的座舱交互方案和技术方案，提升用户驾驶和娱乐体验；

人机交互企业研究的国内外现状

微软

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Microsoft Research's Human-Computer Interaction Group (HCI@MSR) comprises a world-renowned, interdisciplinary team of research scientists, engineers, and designers who take a user-centered approach to developing, designing, and studying computing technology and its use. Areas of specialty within our team include topics such as interaction techniques and devices, social computing and computer-supported cooperative work, interactive machine learning and crowd-powered systems, information visualization, productivity, augmented and virtual reality, affective computing, wearables, inclusive/accessible technology design, technologies for emerging markets, and ethnography.

谷歌

Google Research Philosophy Research Areas Publications People Tools & Downloads Outreach Careers Blog

RESEARCH AREAS ›

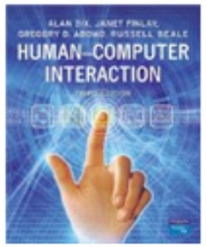
Human-Computer Interaction and Visualization

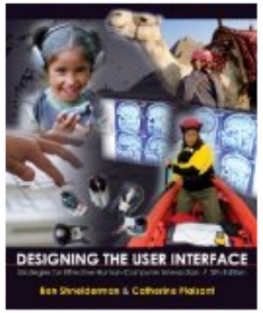
HCI researchers at Google have enormous potential to impact the experience of Google users as well as conduct innovative research. Grounded in user behavior understanding and real use, Google's HCI researchers invent, design, build and trial large-scale interactive systems in the real world. We declare success only when we positively impact our users and user communities, often through new and improved Google products. HCI research has fundamentally contributed to the design of Search, Gmail, Docs, Maps, Chrome, Android, YouTube, serving over a billion daily users. We are engaged in a variety of HCI disciplines such as predictive and intelligent user interface technologies and software, mobile and ubiquitous computing, social and collaborative computing, interactive visualization and visual analytics. Many projects heavily incorporate machine learning with HCI, and current projects include predictive user interfaces; recommenders for content, apps, and activities; smart input and prediction of text on mobile devices; user engagement analytics; user interface development tools; and interactive visualization of complex data.

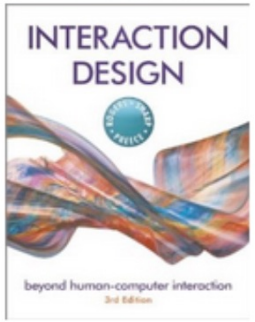
课程产出

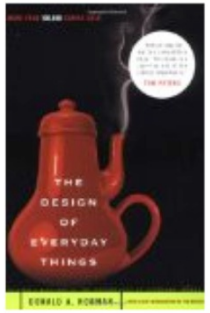
Course Learning Outcome	Exemplary	Competent	Needs Work	Unsatisfactory
Understanding the basic concepts and methods in HCI research	Define and clarify the basic HCI concepts and methodologies, and provide proper examples for demonstration	Define and clarify the basic HCI concepts and methodologies.	Define the basic terminologies and methodologies in HCI research, have difficulty in clarifying the details, conditions, and contexts.	Have difficulty in explaining the basic concepts and processes of common design / prototyping / evaluation methods in HCI research
Understanding the foundations and trends of HCI applications	Elicit the history of HCI applications, the key changes, and driving forces, clarify the major challenges and future directions	Elicit the history of HCI applications, and explain the key changes and driving forces	Elicit the history of HCI applications, have difficulty in explaining the key changes and driving forces	Have difficulty in identifying the core values, scopes, challenges, and trends in HCI applications
Design an interactive system using various methods through different design activities	Conduct common design activities such as needfinding, make good use of design tools such as mindmap, and generate clear design insights	Conduct common design activities such as needfinding and make good use of design tools such as mindmap	Conduct common design activities such as needfinding and brainstorming, have difficulty in using design tools such as mindmap	Have difficulty in conducting common activities such as needfinding and brainstorming in design process to generate design ideas
Prototype an interactive system with assorted digital and physical tools	Conduct common prototyping activities, make good use of various prototyping tools, and generate prototypes at different fidelities	Conduct common prototyping activities and make good use of various prototyping tools	Conduct common prototyping activities, have difficulty in using various prototyping tools	Have difficulty in conducting common prototyping activities and using various prototyping tools
Evaluate an interactive system through user studies	Design and conduct user studies and data analysis, make good use of various prototyping tools, and generate good design implications	Design and conduct user studies and data analysis, and make good use of various prototyping tools	Design and conduct user study and data analysis, have difficulty in using various evaluation tools	Have difficulty in designing user studies and conducting data analysis
An ability to communicate effectively with target users and different stakeholders in academia and industry	Explain HCI designs / applications to a general audience and handle questions, and make good use of multimedia	Explain HCI designs / applications to a general audience and handle questions	Explain HCI designs / applications to a general audience, have difficulty in handling questions	Have difficulty in explaining HCI designs / applications to a general audience

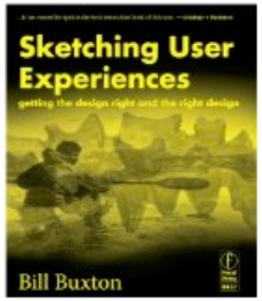
更多的人机交互学习途径

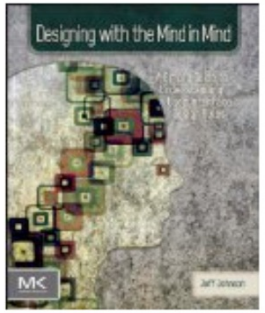


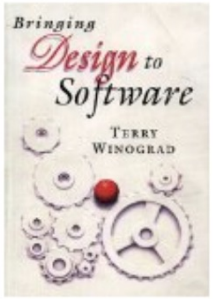






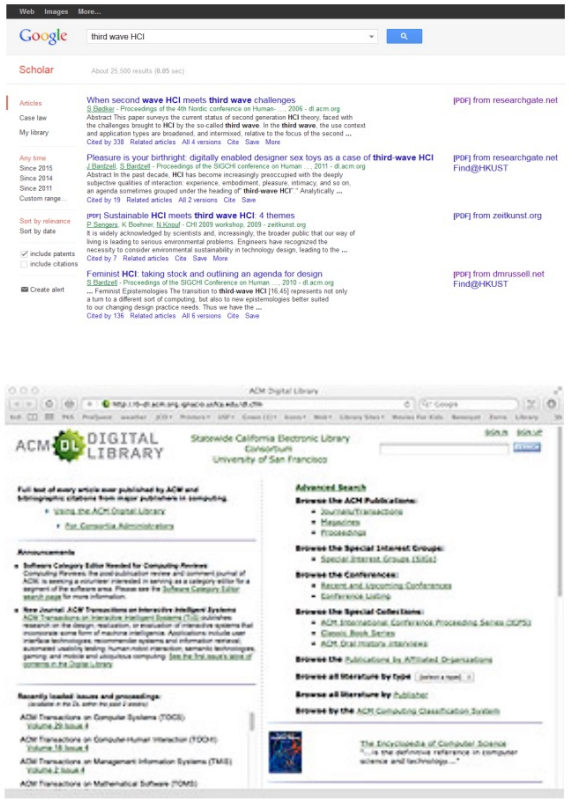


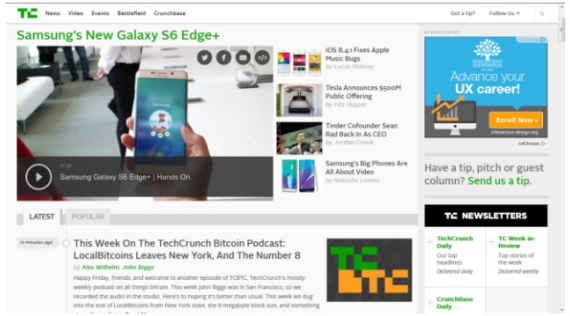


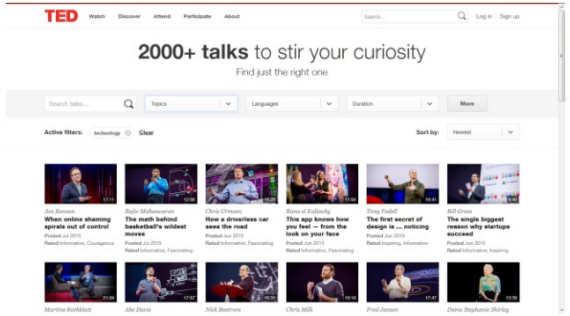


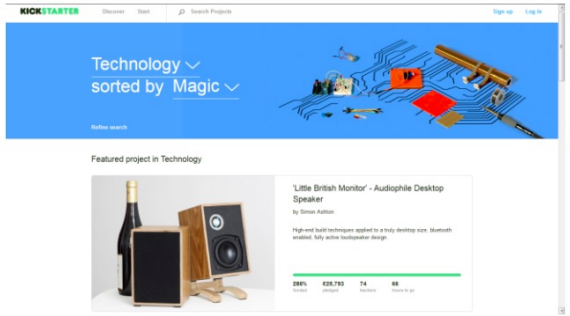
“Stay hungry. Stay foolish.”

- By Steve Jobs









人机交互

人机交互：过去，现在，未来

彭振辉
中山大学人工智能学院
2023年

Design a system to help farmers sort fruit?

https://www.theverge.com/2017/12/9/16751220/tomato-sorting-machine-fast-gif-video
https://timesofindia.indiatimes.com/viral-news/this-simple-sorting-by-size-system-for-fruits-leave-netizensawestruck/articleshow/76683836.cms

https://twitter.com/mrcatacroquer/status/1386318820529217540

用户对象：老年人（年龄80+）；较少使用智能设备的经验
使用场景：在家里给亲人朋友打电话

作为他们的孙子孙女，给他们买什么设备与他人沟通？

Why should we Care?

Technological Innovation ≠ Social Advancement

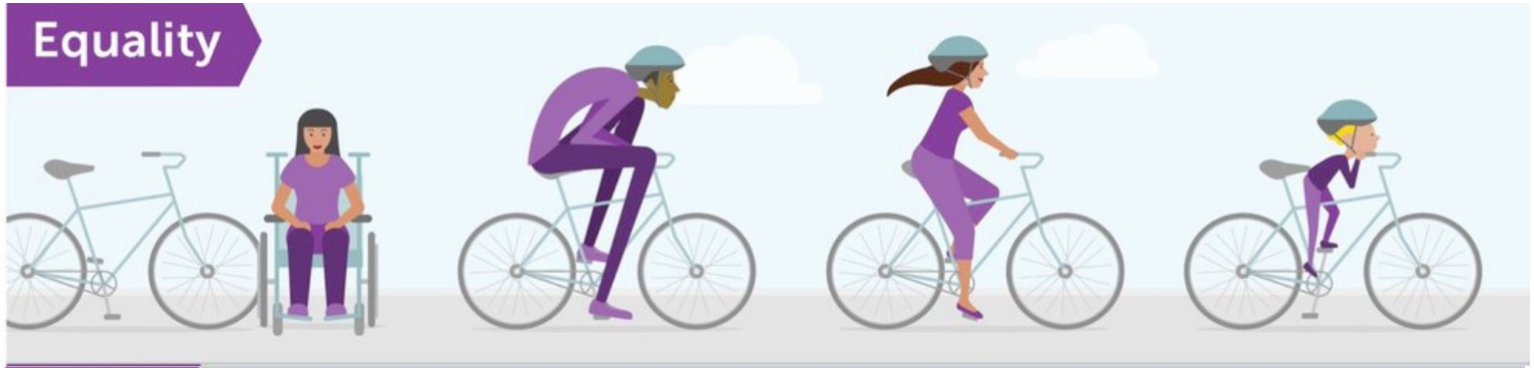
http://www.toptech24.com/wp-content/uploads/2015/06/KGJKNSMD.jpg https://thewallacepost.files.wordpress.com/2014/09/joel-asa-word-cloud.jpg

公益广告《关爱老人“智能”有温度》

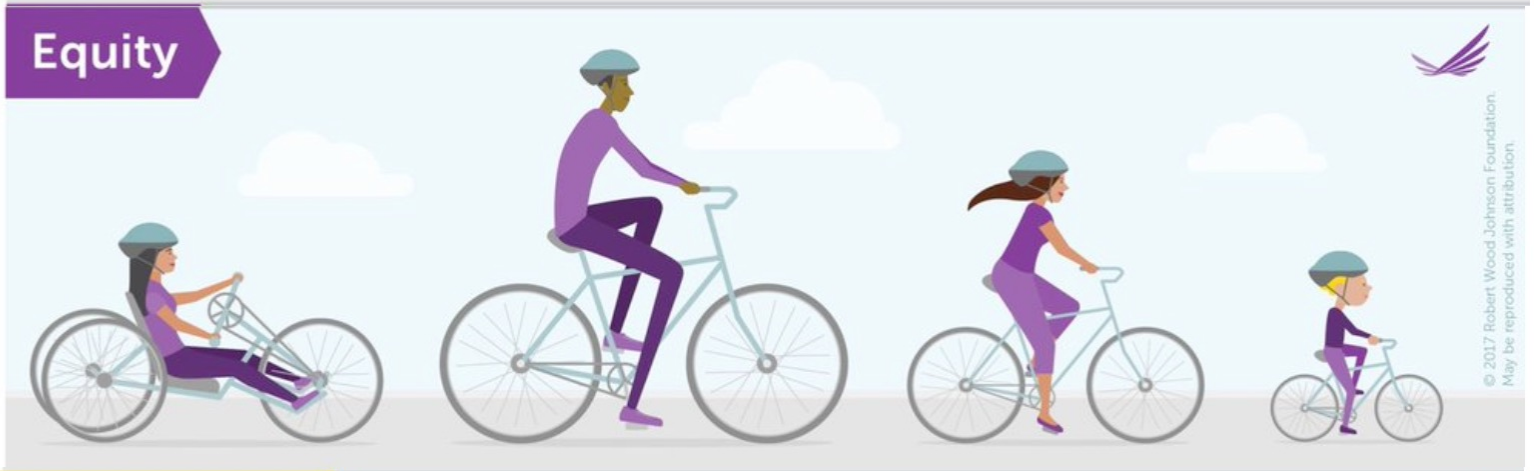
https://haokan.baidu.com/v?pd=wisenatural&vid=5838651053355570727

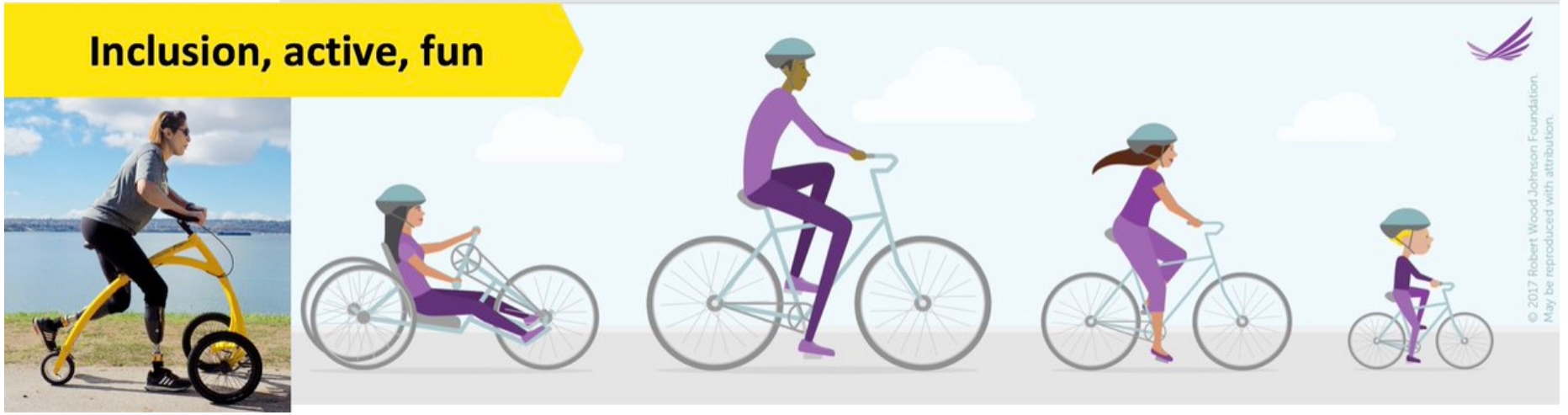
https://www.facebook.com/avantgardens.org/videos/pay-sit-coinoperated-bench/2285500741463674/

Technology Development



HCI's Ultimate Goal





https://twitter.com/TheAlinker/status/983004283577798656/photo/1

What is Human-Computer Interaction (HCI)?

"Human-computer interaction is a discipline concerned with the design, evaluation and implementation of **interactive computing systems for human use** and with the study of major phenomena surrounding them"

(by ACM SIGCHI Curricula for Human-Computer Interaction)

This?

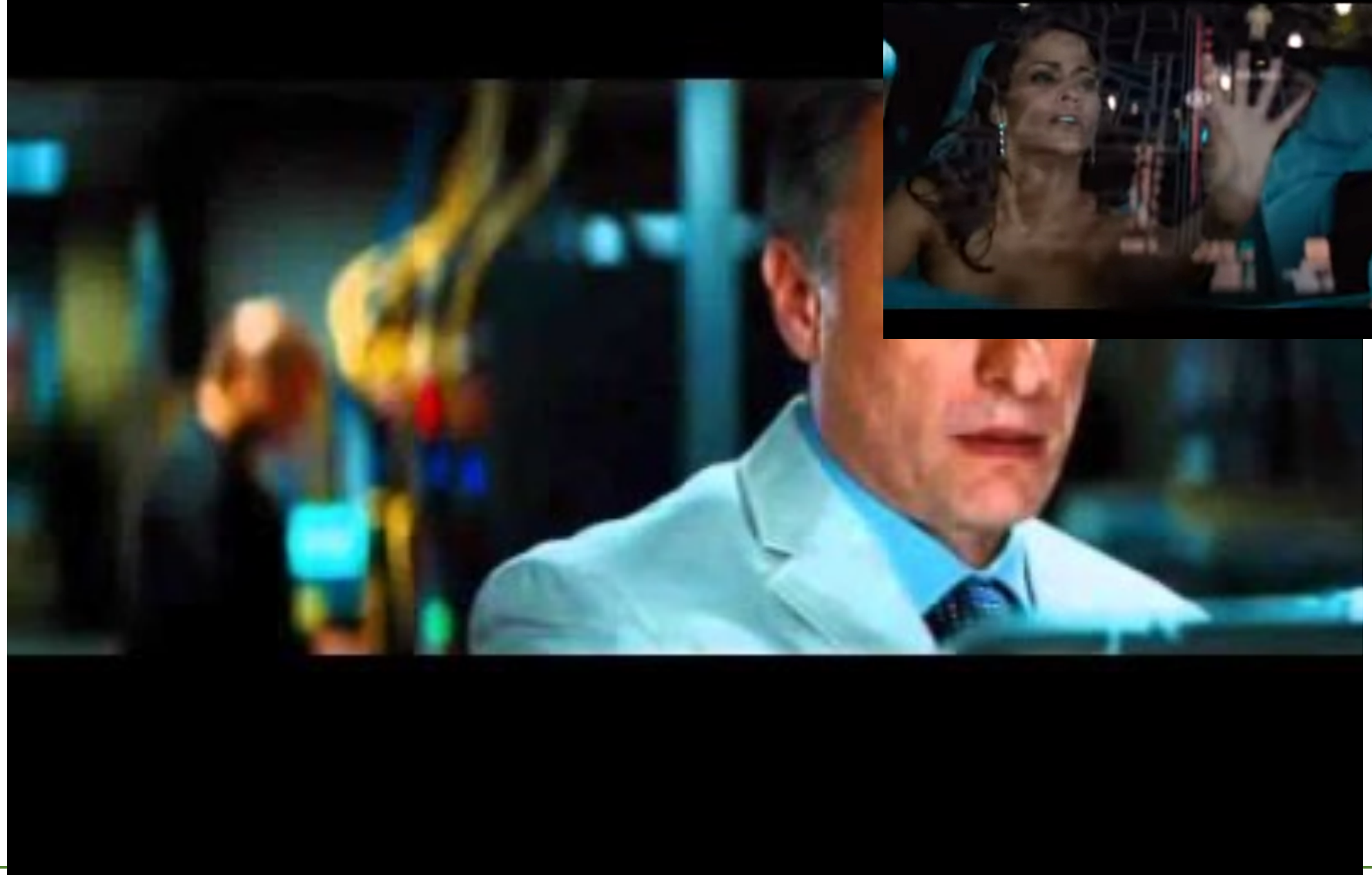
https://www.youtube.com/watch?v=wbO-vY9tbNY&list=PLqhXYFYmZ-VeryE_-9sJuc0oo1e_szTkTa&index=2

Expectations for Future Computing

- **Natural Interaction**
  - Embodied, embedded, …
- **Intelligent Service**
  - Autonomous, personalized, …
  - Private, secure, ...
- **Engaging Experience**
  - Immersive, affective, …
  - Healthy, social, ...


↑The Man from U.N.C.L.E (2015)
↓Mission in Possible 4 (2011)

https://www.youtube.com/watch?v=dU--rVFU45g



https://www.youtube.com/watch?v=8vHkvVZL5gk

What has changed and what hasn't?

Future Best Way to Unlock your Car

← Smart Device

Biometrics →

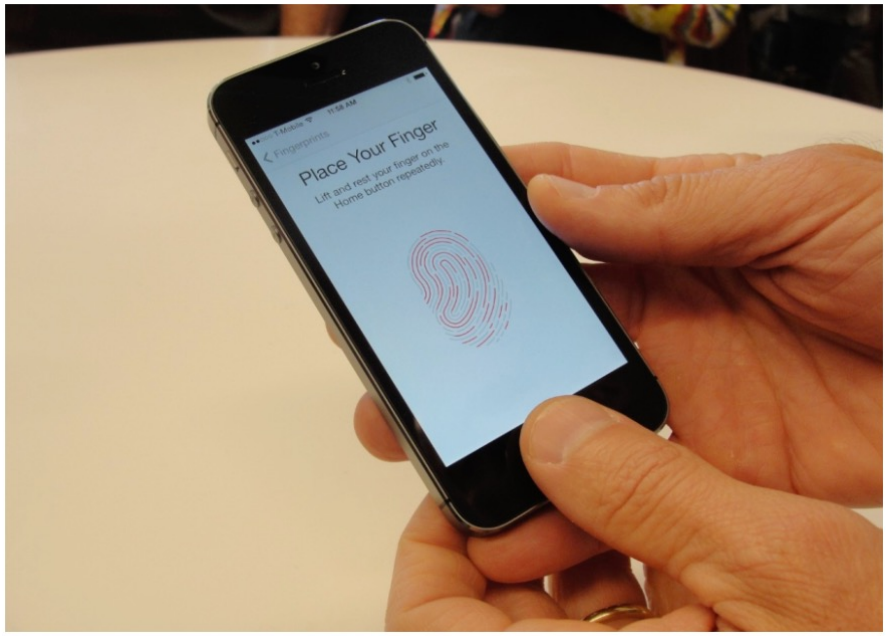
But…

http://orig03.deviantart.net/8d0b/f/2015/081/5/0/mission_impossible_5_rogue_nation_wallpaper_by_sachso74-d8mqk4s.jpg

What is Human-Computer Interaction (HCI)?

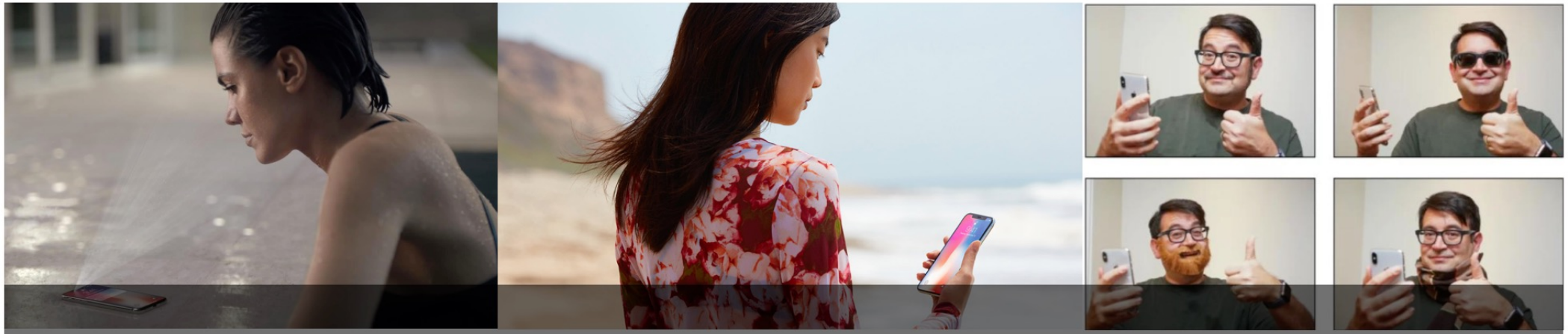
"Human-computer interaction is a discipline concerned with the design, evaluation and implementation of **interactive computing systems for human use** and with the study of major phenomena surrounding them"

(by ACM SIGCHI Curricula for Human-Computer Interaction)

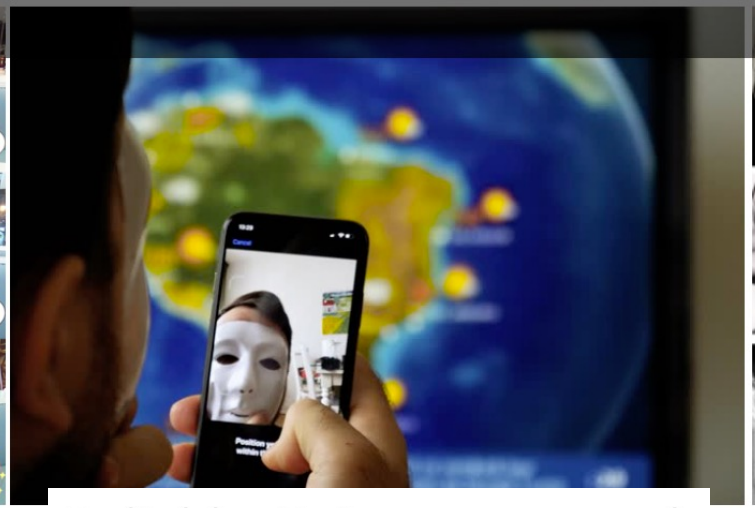


Developers' Mental Model ≠ Users' Mental Model

Robust: Works for the owner whenever wherever needed



Working in the lab ≠ Applicable in Real World



Reliable: Rejects any attack

How Close and How Far?

Historical CHI Video Project

Bringing 1983-2002 treasures to the ACM Digital Library

https://www.youtube.com/watch?v=2C5iIxssa3I

Gummi: A Bendable Computer

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ABSTRACT

Gummi is an interaction technique and device concept based on physical deformation of a handheld device. The device consists of several layers of flexible electronic components, including sensors measuring deformation of the device. Users interact with this device by a combination of bending and 2D position control. Gummi explores physical interaction techniques and screen interfaces for such a device. Its graphical user interface facilitates a wide range of interaction tasks, focused on browsing of visual information. We implemented both hardware and software prototypes to explore and evaluate the proposed interaction techniques.

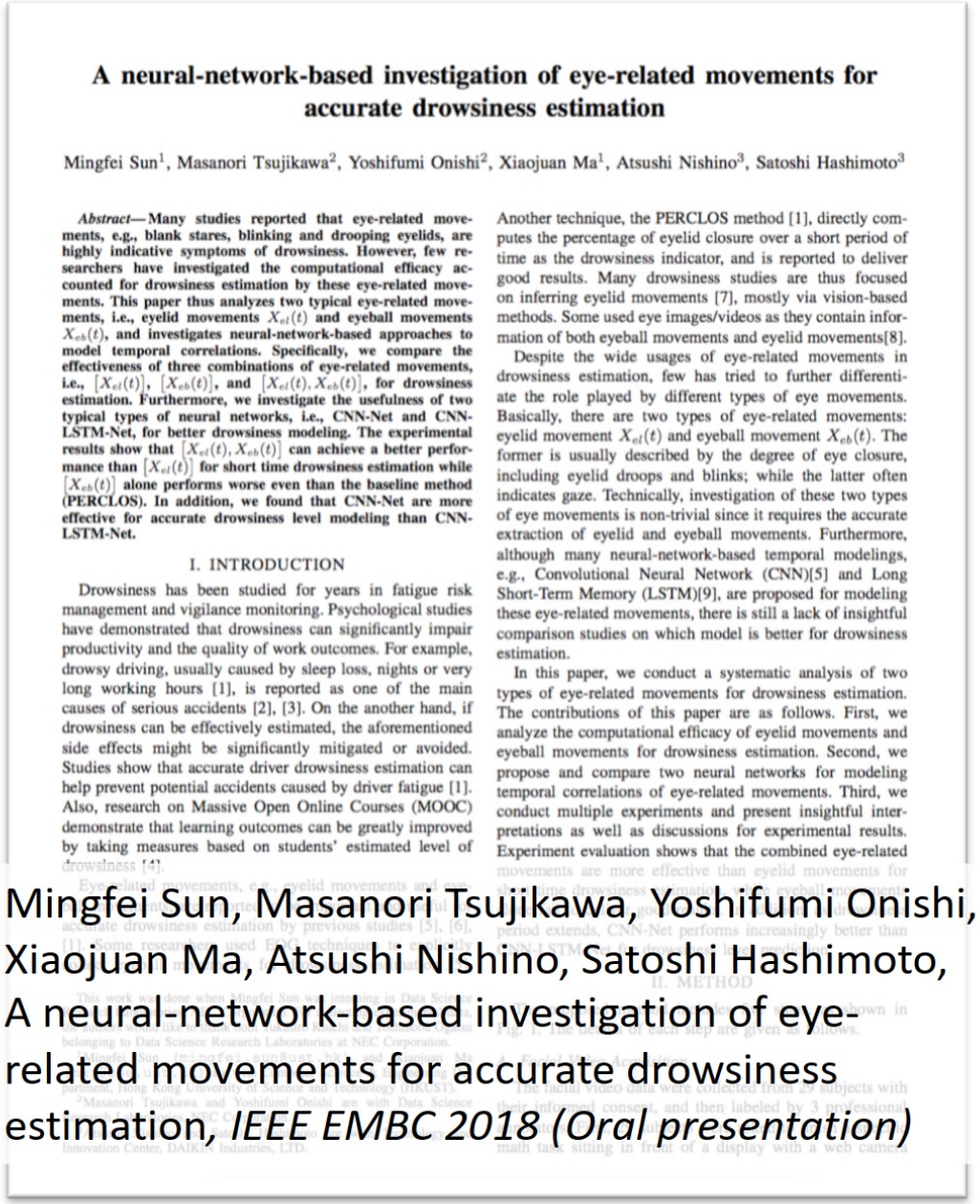
Our evaluations have shown that users can grasp Gummi's key interaction principles within minutes. Gummi demonstrates promising possibilities for new interaction techniques and devices based on flexible electronic components.

Author Keywords

Handheld devices, mobile computing, interaction design, GUI, embodied interaction, flexible electronics, smartcards.

Figure 1: Gummi Device and Bending Interaction

Carsten Schwesig, Ivan Poupyrev, and Eijiro Mori. 2004. Gummi: a bendable computer. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '04). ACM, New York, NY, USA, 263-270.



A neural-network-based investigation of eye-related movements for accurate drowsiness estimation

Mingfei Sun[1], Masanori Tsujikawa[2], Yoshifumi Onishi[2], Xiaojuan Ma[1], Atsushi Nishino[3], Satoshi Hashimoto[3]

***Abstract*— Many studies reported that eye-related movements, e.g., blank stares, blinking and drooping eyelids, are highly indicative symptoms of drowsiness. However, few researchers have investigated the computational efficacy accounted for drowsiness estimation by these eye-related movements. This paper thus analyzes two typical eye-related movements, i.e., eyelid movements $X_{el}(t)$ and eyeball movements $X_{eb}(t)$, and investigates neural-network-based approaches to model temporal correlations. Specifically, we compare the effectiveness of three combinations of eye-related movements, i.e., $[X_{el}(t)]$, $[X_{eb}(t)]$, and $[X_{el}(t), X_{eb}(t)]$, for drowsiness estimation. Furthermore, we investigate the usefulness of two typical types of neural networks, i.e., CNN-Net and CNN-LSTM-Net, for better drowsiness modeling. The experimental results show that $[X_{el}(t), X_{eb}(t)]$ can achieve a better performance than $[X_{el}(t)]$ for short time drowsiness estimation while $[X_{eb}(t)]$ alone performs worse even than the baseline method (PERCLOS). In addition, we found that CNN-Net are more effective for accurate drowsiness level modeling than CNN-LSTM-Net.**

I. INTRODUCTION

Drowsiness has been studied for years in fatigue risk management and vigilance monitoring. Psychological studies have demonstrated that drowsiness can significantly impair productivity and the quality of work outcomes. For example, drowsy driving, usually caused by sleep loss, nights or very long working hours [1], is reported as one of the main causes of serious accidents [2], [3]. On the another hand, if drowsiness can be effectively estimated, the aforementioned side effects might be significantly mitigated or avoided. Studies show that accurate driver drowsiness estimation can help prevent potential accidents caused by driver fatigue [1]. Also, research on Massive Open Online Courses (MOOC) demonstrate that learning outcomes can be greatly improved by taking measures based on students' estimated level of drowsiness [4].

Another technique, the PERCLOS method [1], directly computes the percentage of eyelid closure over a short period of time as the drowsiness indicator, and is reported to deliver good results. Many drowsiness studies are thus focused on inferring eyelid movements [7], mostly via vision-based methods. Some used eye images/videos as they contain information of both eyeball movements and eyelid movements[8].

Despite the wide usages of eye-related movements in drowsiness estimation, few has tried to further differentiate the role played by different types of eye movements. Basically, there are two types of eye-related movements: eyelid movement $X_{el}(t)$ and eyeball movement $X_{eb}(t)$. The former is usually described by the degree of eye closure, including eyelid droops and blinks; while the latter often indicates gaze. Technically, investigation of these two types of eye movements is non-trivial since it requires the accurate extraction of eyelid and eyeball movements. Furthermore, although many neural-network-based temporal modelings, e.g., Convolutional Neural Network (CNN)[5] and Long Short-Term Memory (LSTM)[9], are proposed for modeling these eye-related movements, there is still a lack of insightful comparison studies on which model is better for drowsiness estimation.

In this paper, we conduct a systematic analysis of two types of eye-related movements for drowsiness estimation. The contributions of this paper are as follows. First, we analyze the computational efficacy of eyelid movements and eyeball movements for drowsiness estimation. Second, we propose and compare two neural networks for modeling temporal correlations of eye-related movements. Third, we conduct multiple experiments and present insightful interpretations as well as discussions for experimental results. Experiment evaluation shows that the combined eye-related

Mingfei Sun, Masanori Tsujikawa, Yoshifumi Onishi, Xiaojuan Ma, Atsushi Nishino, Satoshi Hashimoto, A neural-network-based investigation of eye-related movements for accurate drowsiness estimation, *IEEE EMBC 2018 (Oral presentation)*

Japanese enterprises develop anti drowsy air conditioning system, find that employees feel sleepy and automatically cool down.

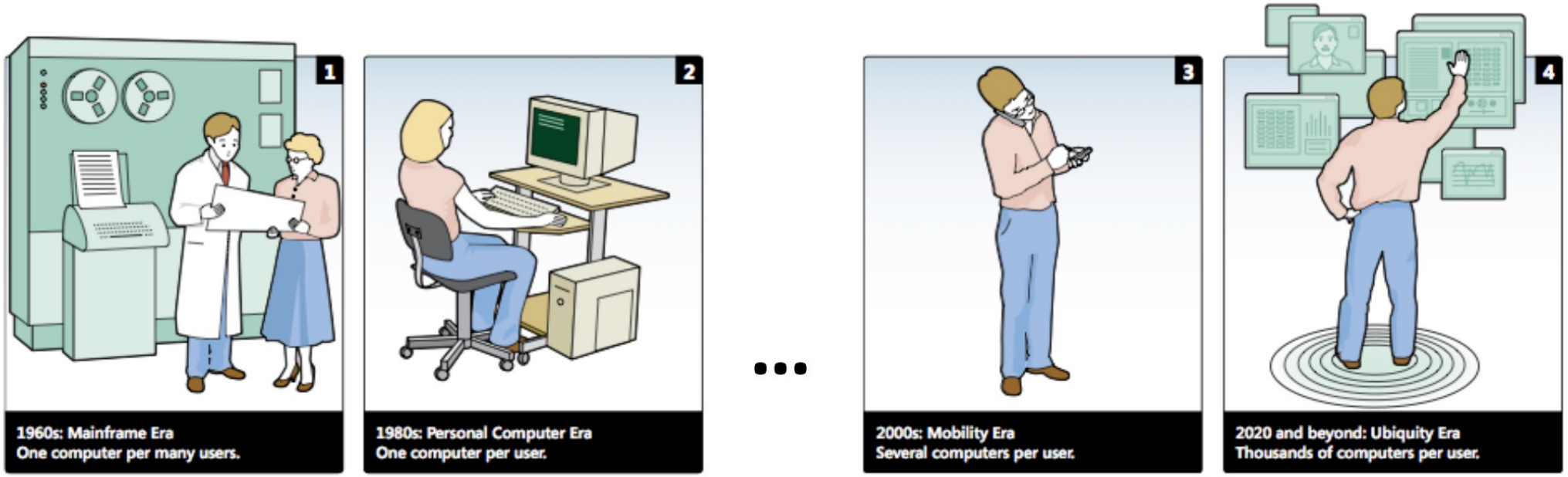
2018-07-29 02:01:41 category:Hot click:222

https://www.jqknews.com/news/49382-Japanese_enterprises_develop_anti_drowsy_air_conditioning_system_find_that_employees_feel_sleepy_and_automatically_cool down.html

The History of HCI

- Technological advances

(Bødker et al., 06; Harrison et al., 07)



1st Paradigm **2nd Paradigm** **3rd Paradigm**

We are here!

- Key people and events

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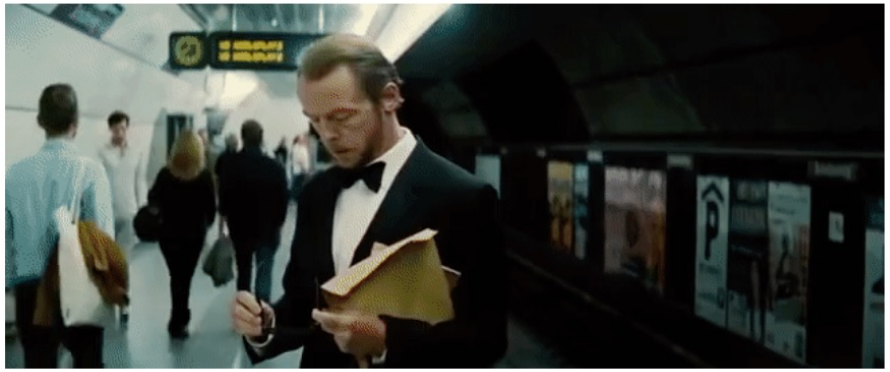
The History of HCI

- Technological advances



1st Paradigm **2nd Paradigm** **3rd Paradigm**

We are here!

- Key people and events

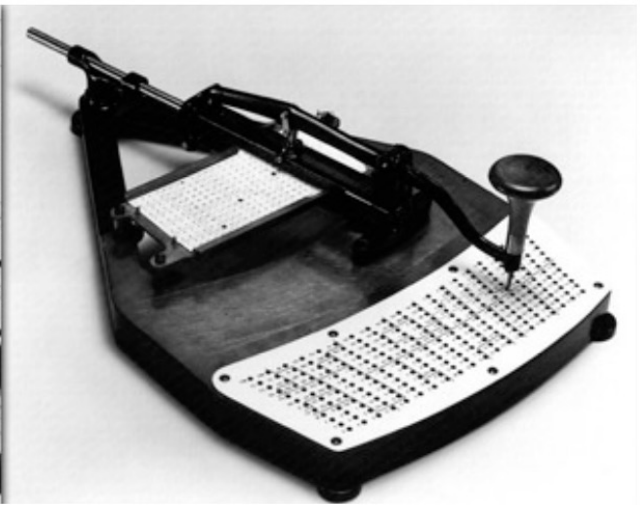
https://www.interaction-design.org/images/ux-daily/0fe20de19e85872da696c34e38d0e2da.png

Paradigm Shifts (Waves) of HCI

- Classical HCI — "Design things right"
  - Critical incidents
  - As Information systems
- Modern HCI — "Design the right thing"
  - Collaborative tasks
  - As interpreter / predictor
- Contemporary HCI — "Design the right thing right"
  - Non-work settings
  - As situated actors

Classical HCI (or CHI)

- 40's ~ 70's (awareness)
- Discretionary use – "job / tool"
- Engineering: man-machine fit
- Command and form-based interaction



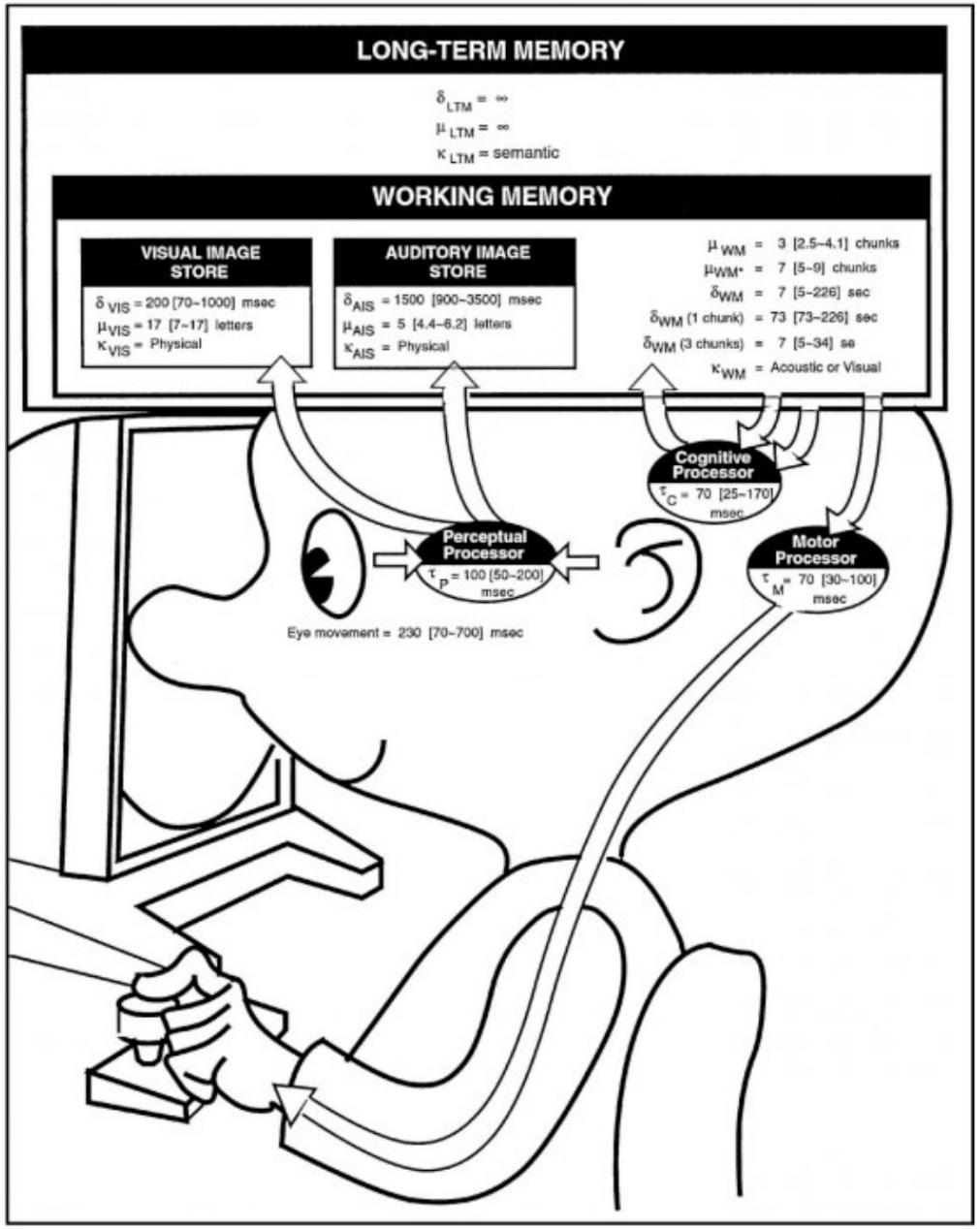
http://farm4.static.flickr.com/3112/2397460077_f3cfface77_o.jpg

http://i.dailymail.co.uk/i/pix/2012/10/19/article-2220065-15938F77000005DC-621_634x392.jpg

Human Factors

(Newell & Simon, 1972)

- Human capacity and limitations
- Assumption
  - De-personalized
  - Unmotivated
  - Single (novice) user
- Method
  - User modeling
  - Rigid guidelines



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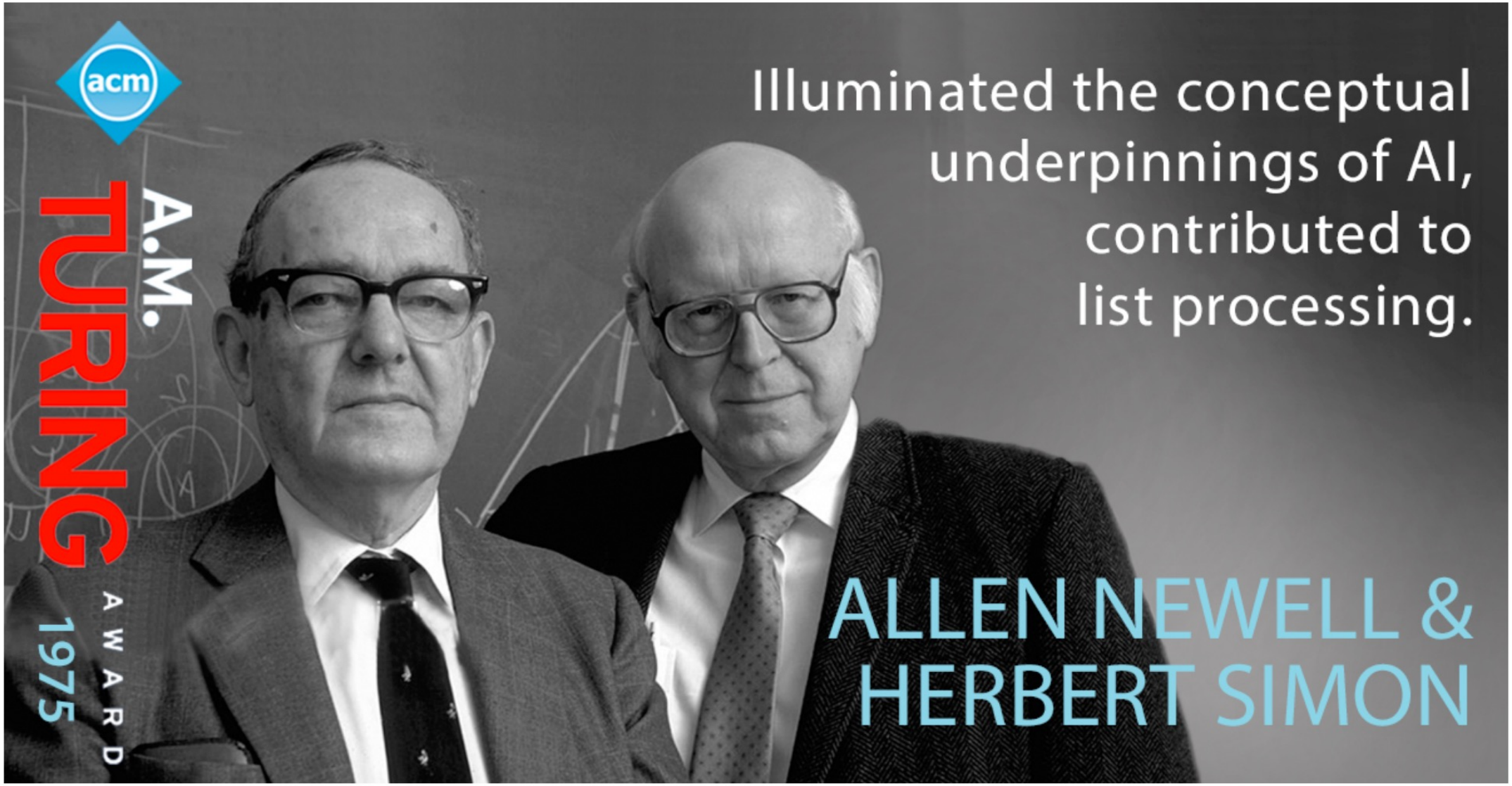
Key Persons



Pioneers of artificial intelligence (AI) and human-computer interaction (HCI): understanding of human cognition and building systems for problem-solving

Modern HCI

- 80's, 90's ~ (prominence)
- Mediated, supported – "medium"
- Science: man-machine communication
- Direct manipulation and metaphor, "WYSIWYG"

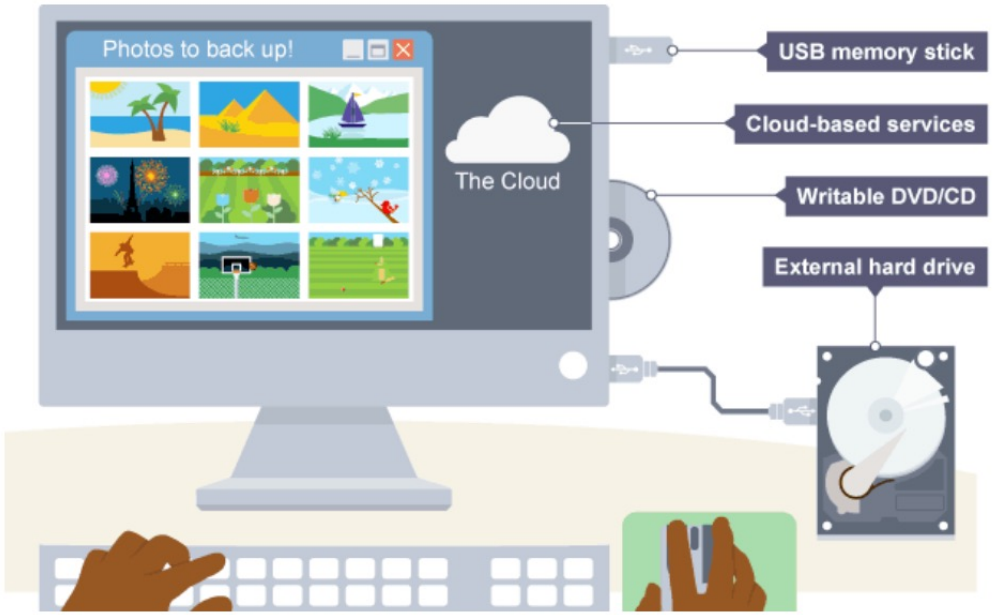
http://content.abt.com/media/apple/images/apple_store_hdr-v5.jpg

http://www.extremetech.com/wp-content/uploads/2011/11/apple-lisa-640x353.jpg

Cognitive and Social Science

(Shneiderman, 1982)

- Human performance in context
- Assumption
  - Active autonomous agent
  - Motivation and ability
  - Social (expert) users
- Method
  - Usability
  - Lab and field studies
  - Participatory design



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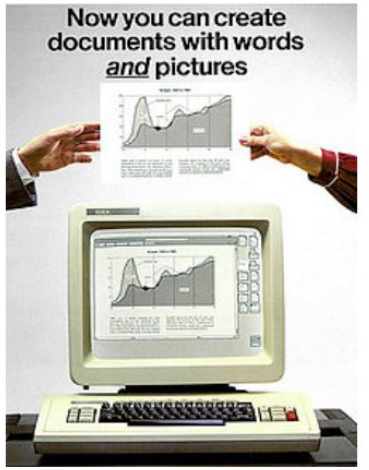
Key Milestones

- Xerox PARC PCs and GUIs
  - Xerox Star (1981)
  - Tabs, pads, boards (1988-1994)
- Apple Macintosh
  - Apple Lisa (1982)
  - Apple Macintosh (1984)
- Microsoft Windows
  - Windows95 WIMP (1995)
  - Office (1990)

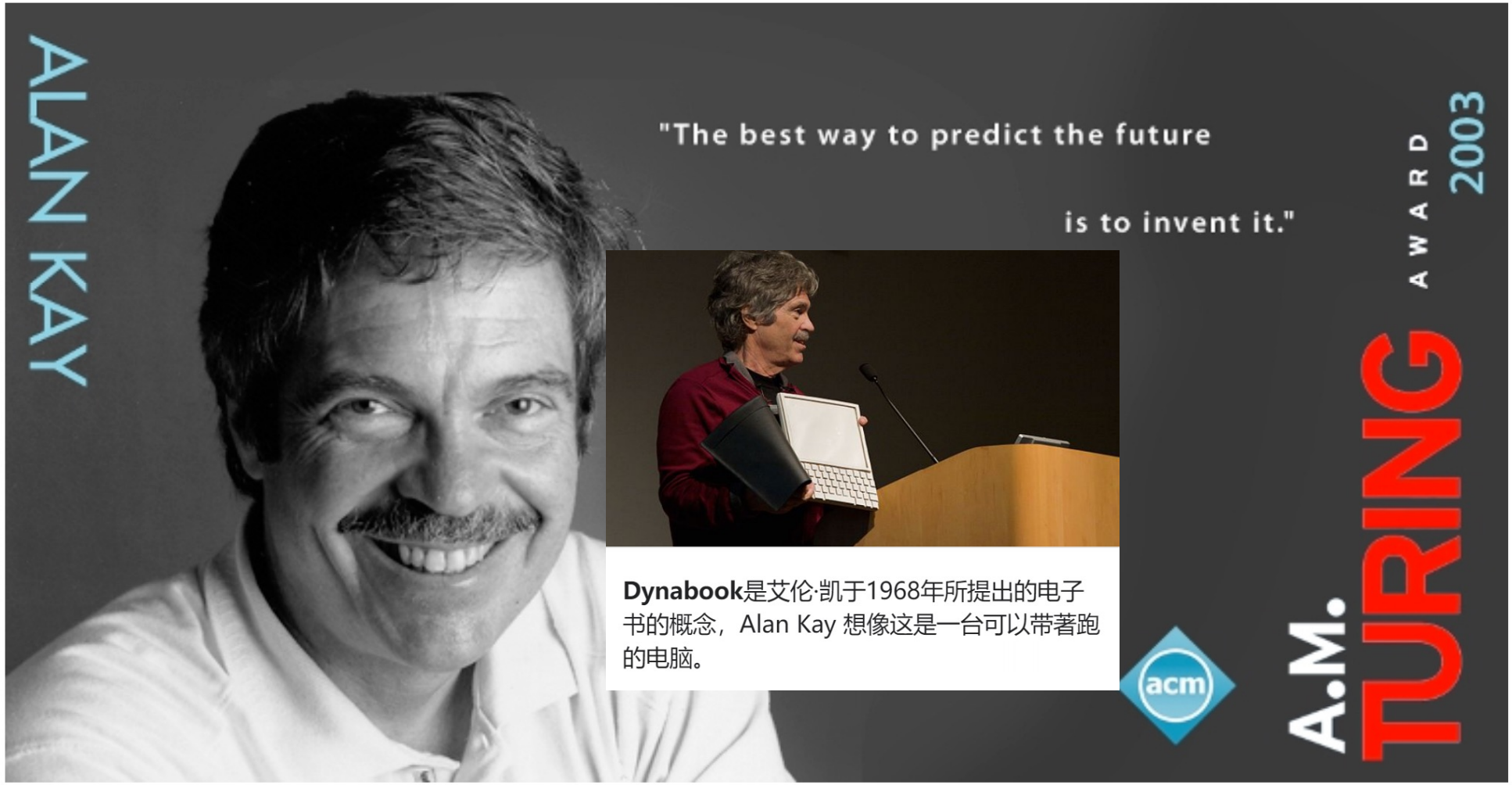


https://en.wikipedia.org/wiki/Xerox_Star

http://everystevejobsvideo.com/wp-content/uploads/2013/02/mac2.jpg

http://www.firstpost.com/wp-content/uploads/2012/08/3Window95_Reuters.jpg

Key Persons



Dynabook是艾伦·凯于1968年所提出的电子书的概念，Alan Kay 想像这是一台可以带著跑的电脑。

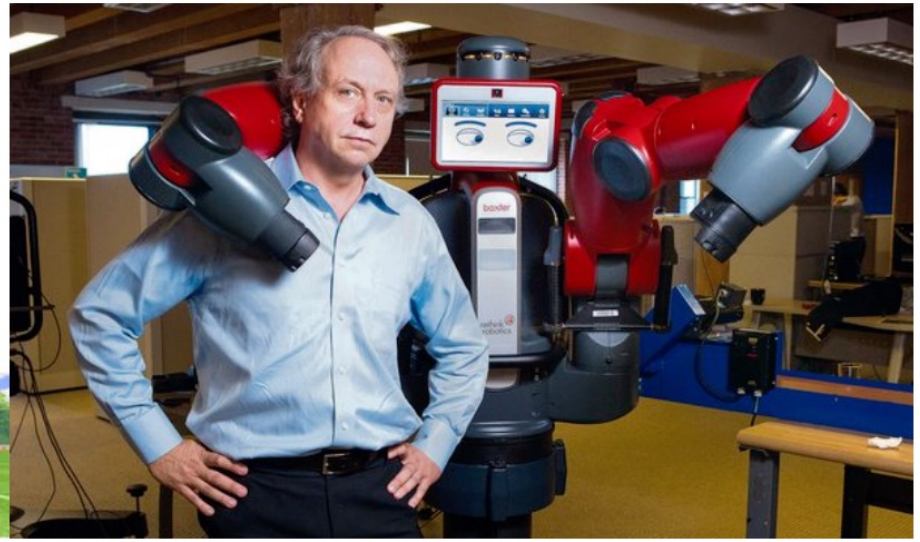
Today's myriad portable computing devices all have roots in Kay's Dynabook, and it is for this that he is sometimes referred to as the "father of personal computers."

Key Persons

Best known for inventing the computer mouse; Engelbart's Law: the capacity for "getting better at getting better" is a uniquely human capability

Contemporary HCI

- Mid, late 2000's ~ (wide attention)
- Reflective practice – "actor"
- Design: man-machine experience
- Embodied engagement with virtual & physica



http://www.gamegrin.com/assets/Uploads/wii-fit-1.jpg

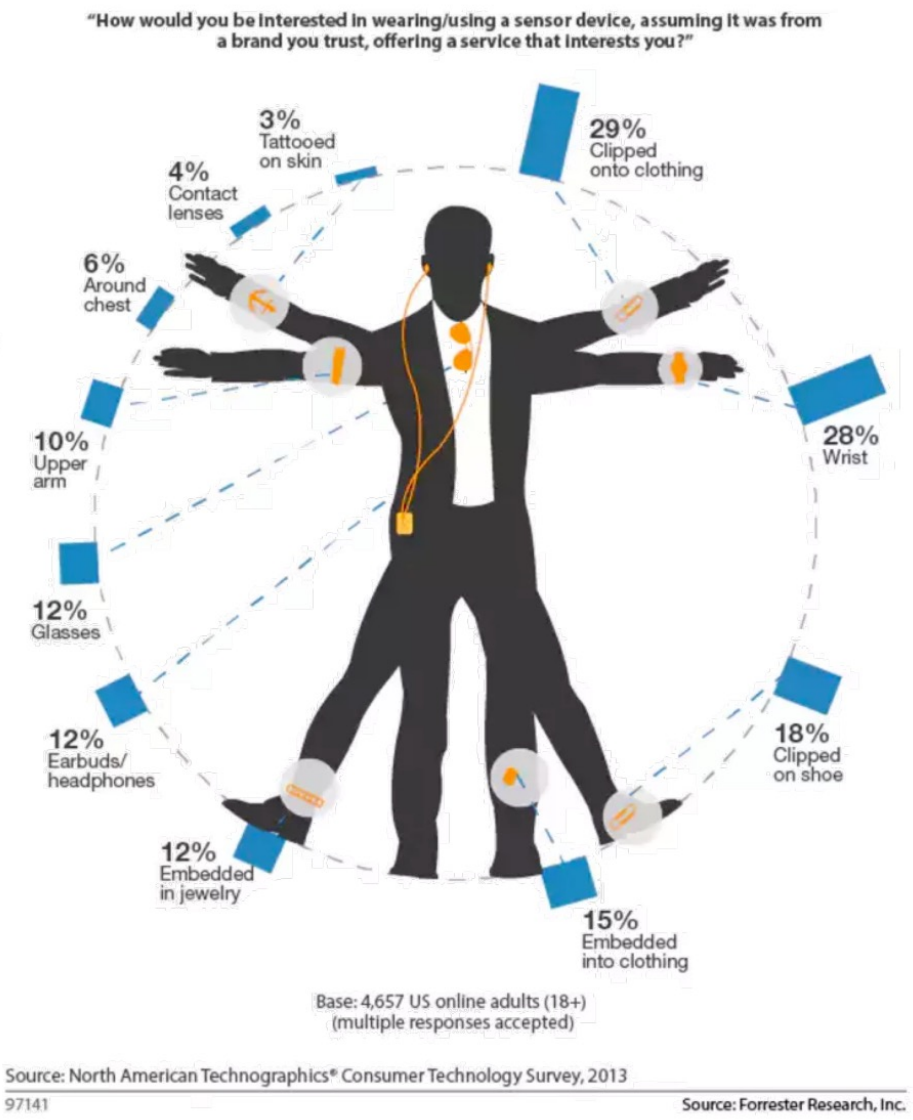
http://ecx.images-amazon.com/images/I/41cZWQwIyDL.jpg

http://www.nytimes.com/2012/09/18/science/a-robot-with-a-delicate-touch.html

Co-Design in the Wild

(Norman, 2013)

- Human life goals
- Assumption
  - Situated actor & everyday designer
  - Values, emotions, culture
  - (Non-)rational users
- Method
  - User experience
  - Exploratory creativity



https://www.interaction-design.org/images/encyclopedia/human_computer_interaction_hci/human_processor_illustrationSmaller.jpg

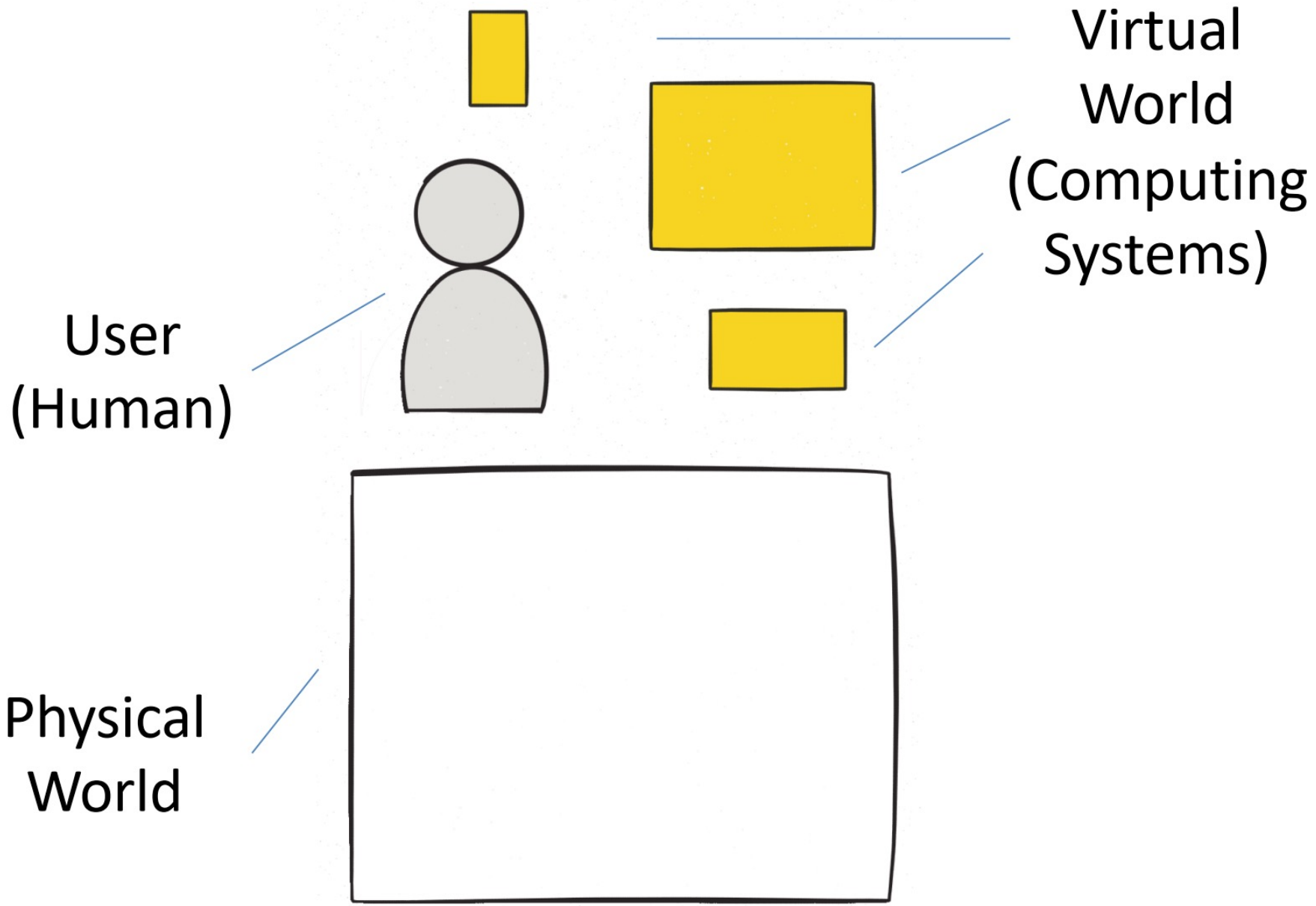
Key Triggers

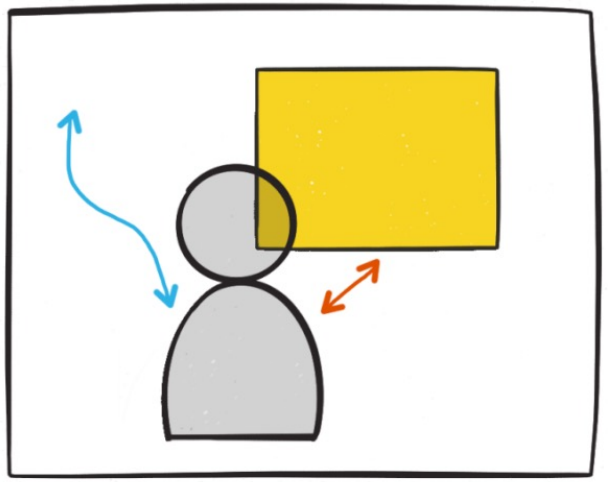
- Technological changes
  - Decreasing hardware costs, dimension, and power consumption leading to larger memories, faster systems, portability, connectivity, ubiquity
  - Innovation in display and input techniques
- Economic changes
  - Sustainability
  - Sharing economy, fan economy, etc.
- Societal changes
  - Post-materialism

http://time.com/3686877/uber-lyft-sharing-economy/

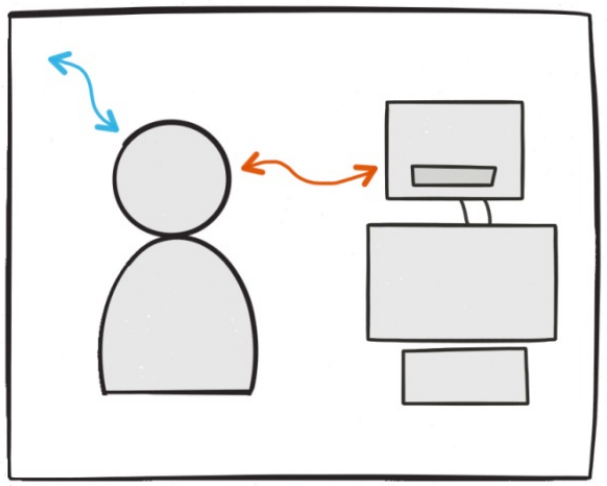
http://www.economist.com/news/leaders/21573104-internet-everything-hire-rise-sharing-economy

(Selected) Scope of HCI

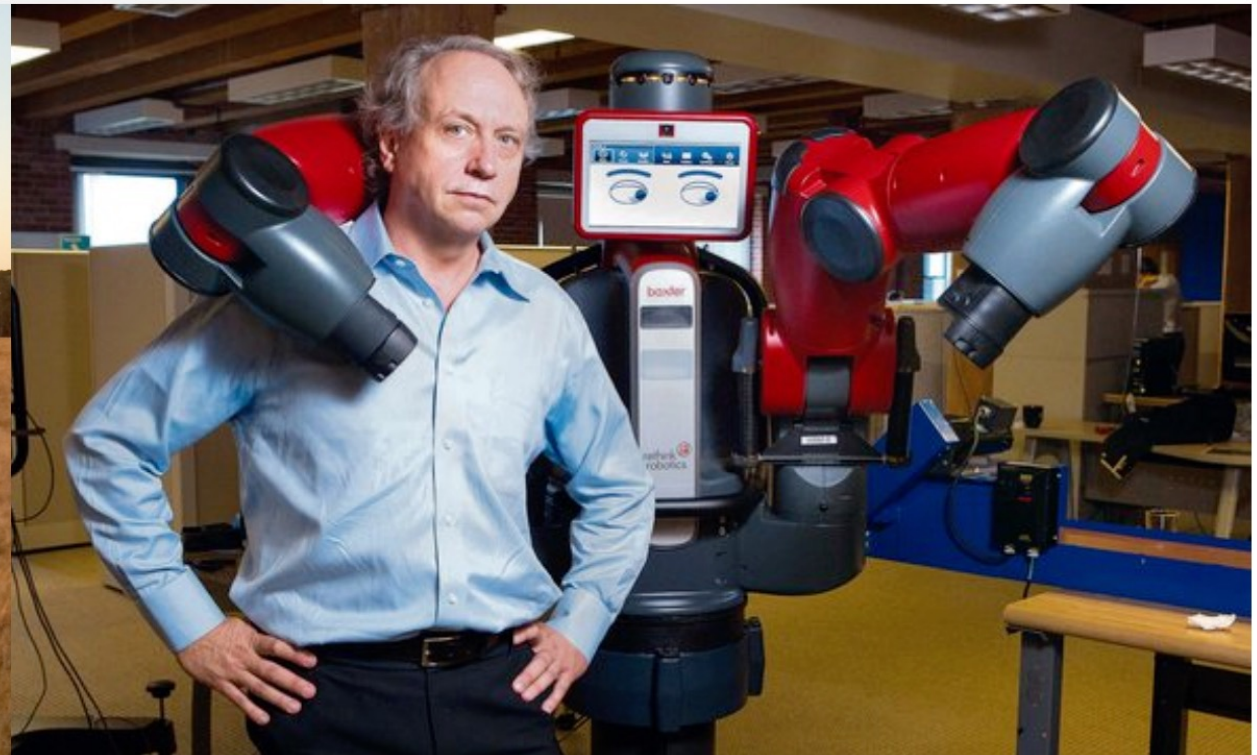


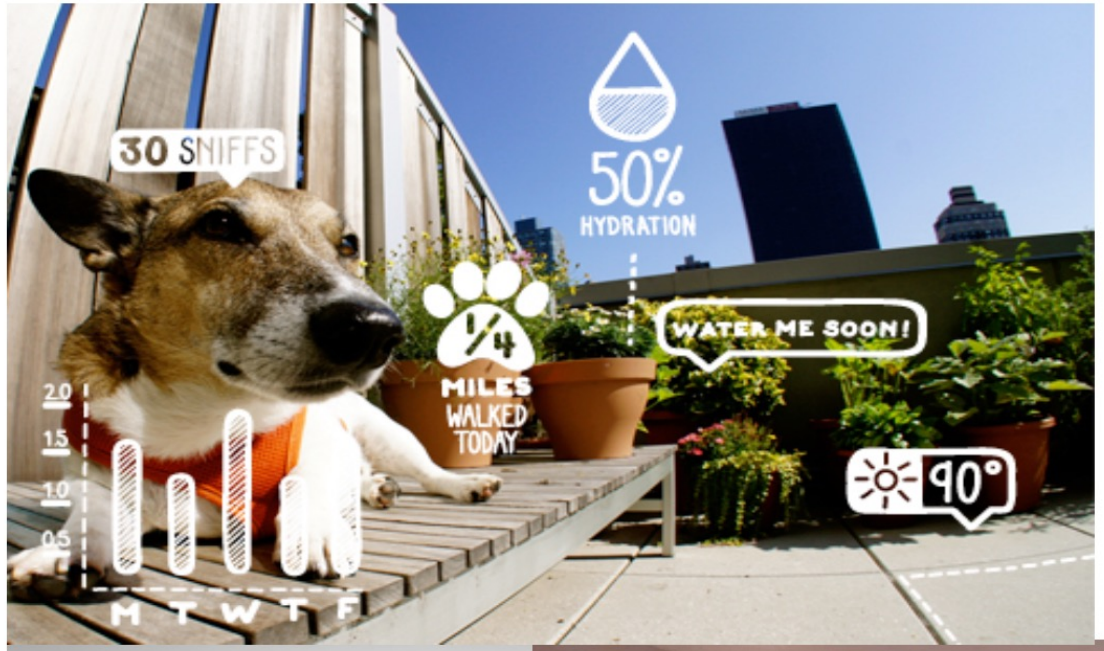


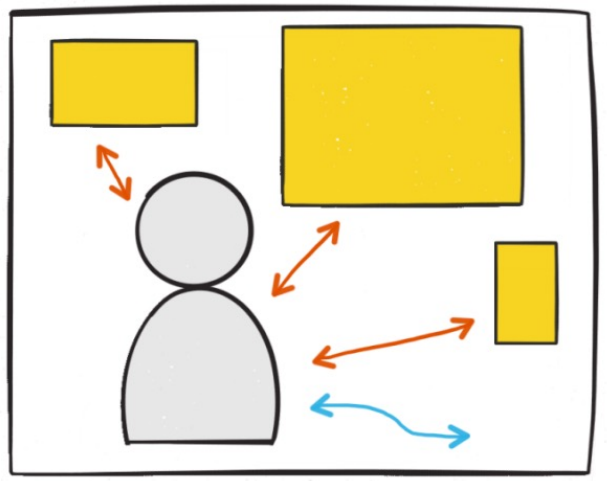
Interaction Techniques



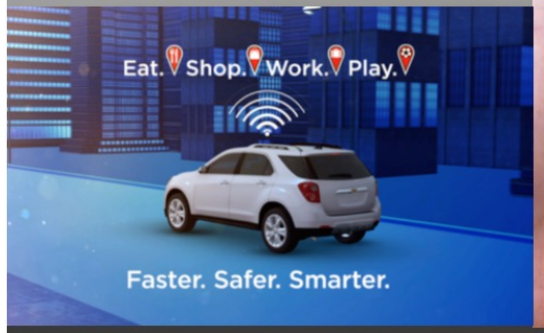
Human-Robot Interaction

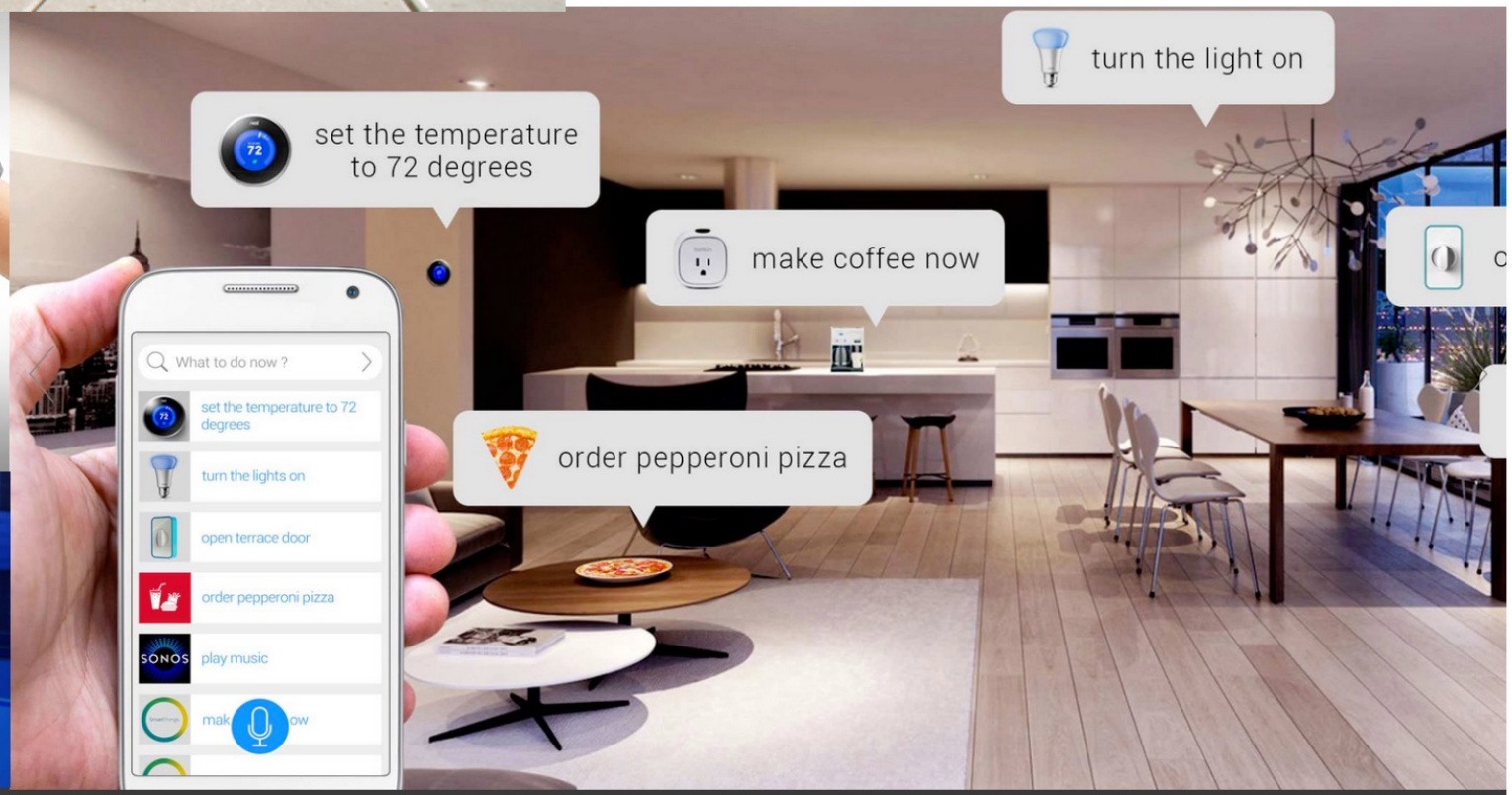


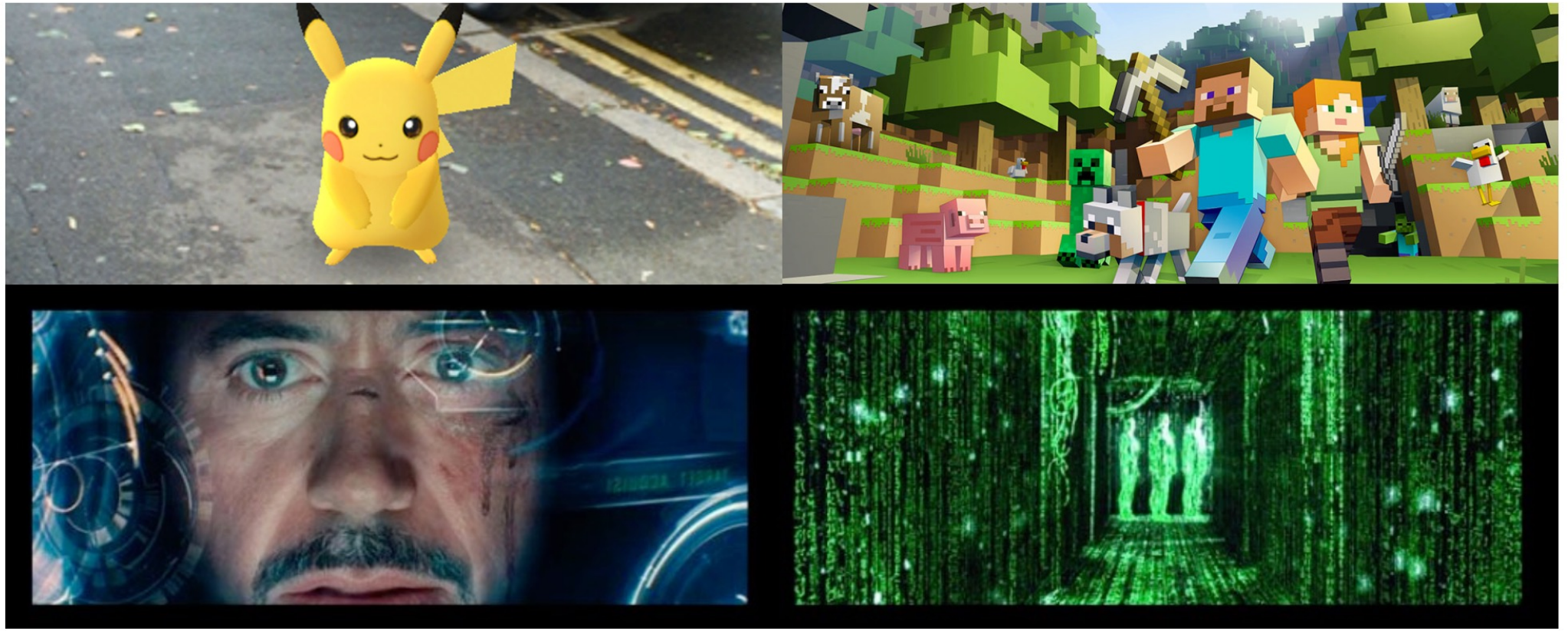


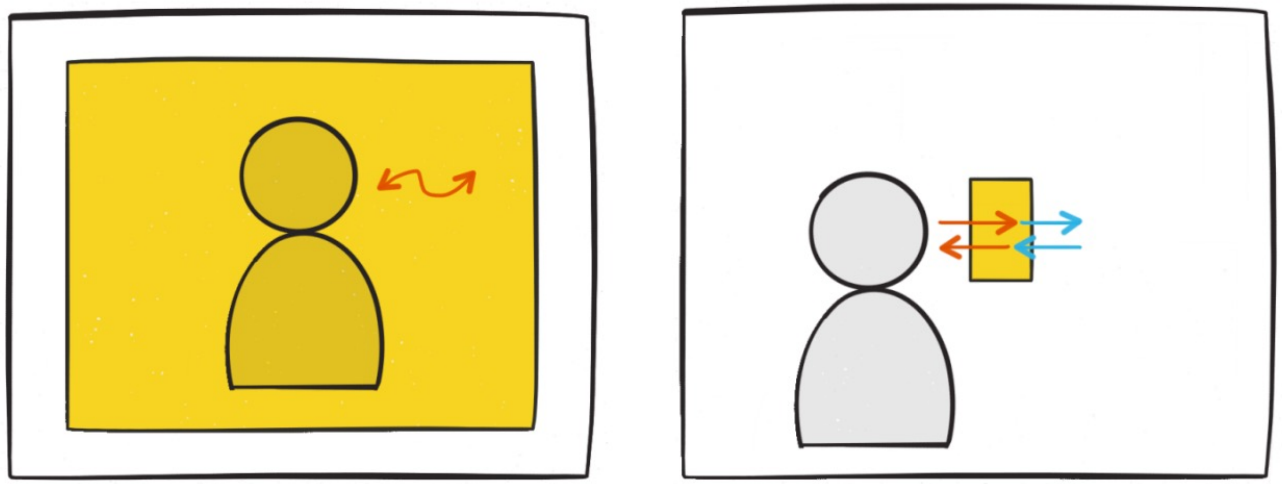


Ubiquitous Computing

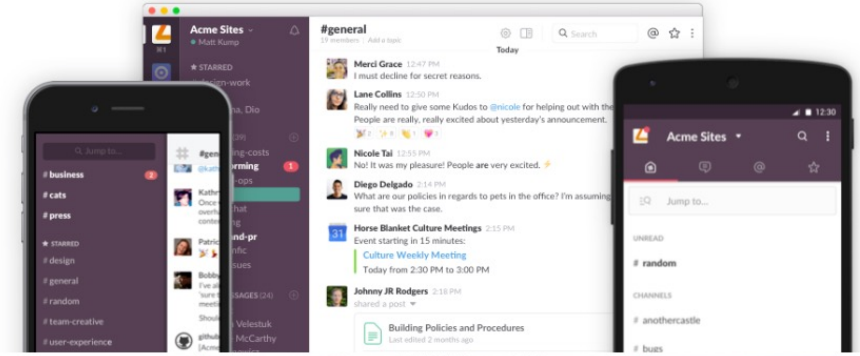


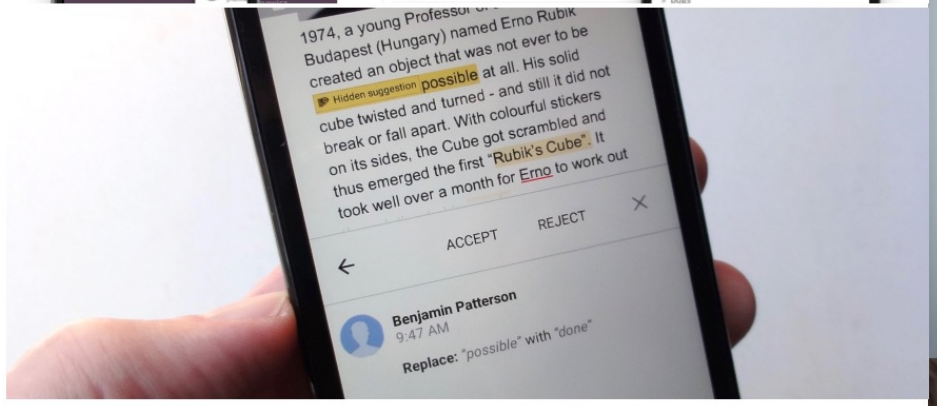




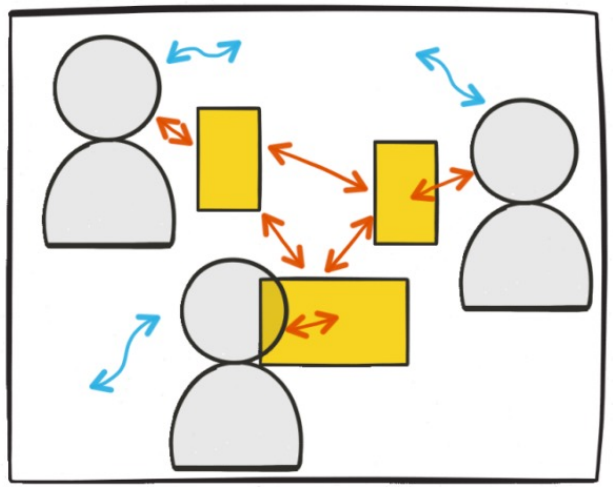


Virtual Reality, Augmented Reality, & Games

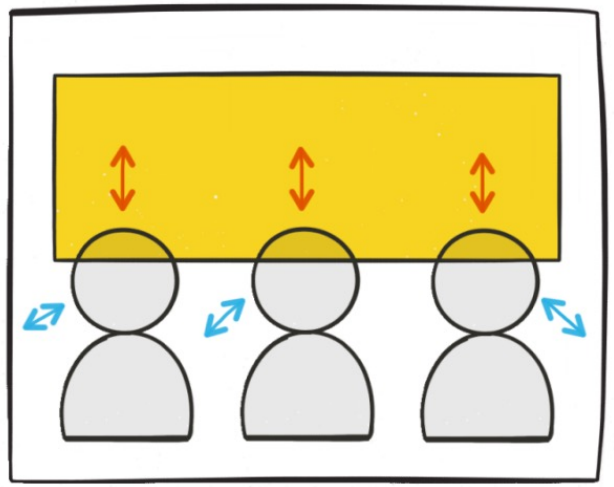

Acme Sites
#general
Merci Grace
I must decline for secret reasons.
Lane Collins
Nicole Tai
Diego Delgado
Horse Blanket Culture Meetings
Culture Weekly Meeting
Today from 2:30 PM to 3:00 PM
Johnny JR Rodgers
Building Policies and Procedures
business
cats
press
design
general
random
team-creative
user-experience
random
anothercastle
bugs


1974, a young Professor
Budapest (Hungary) named Erno Rubik
created an object that was not ever to be
Hidden suggestion possible at all. His solid
cube twisted and turned - and still it did not
break or fall apart. With colourful stickers
on its sides, the Cube got scrambled and
thus emerged the first "Rubik's Cube". It
took well over a month for Erno to work out
ACCEPT
REJECT
Benjamin Patterson
9:47 AM
Replace: "possible" with "done"

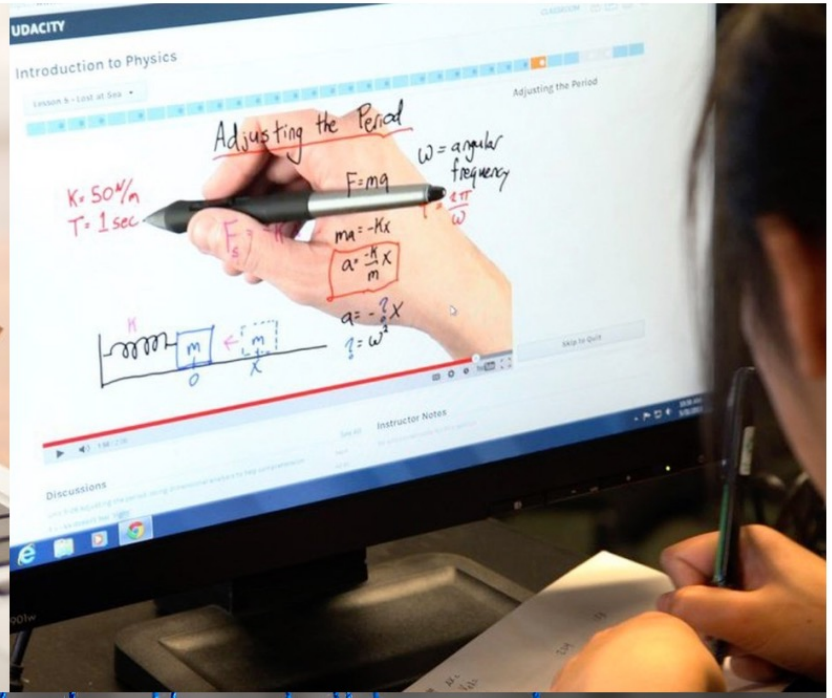

Welcome to WhatsApp!
latform mobile messaging with
iends all over the world
ovi

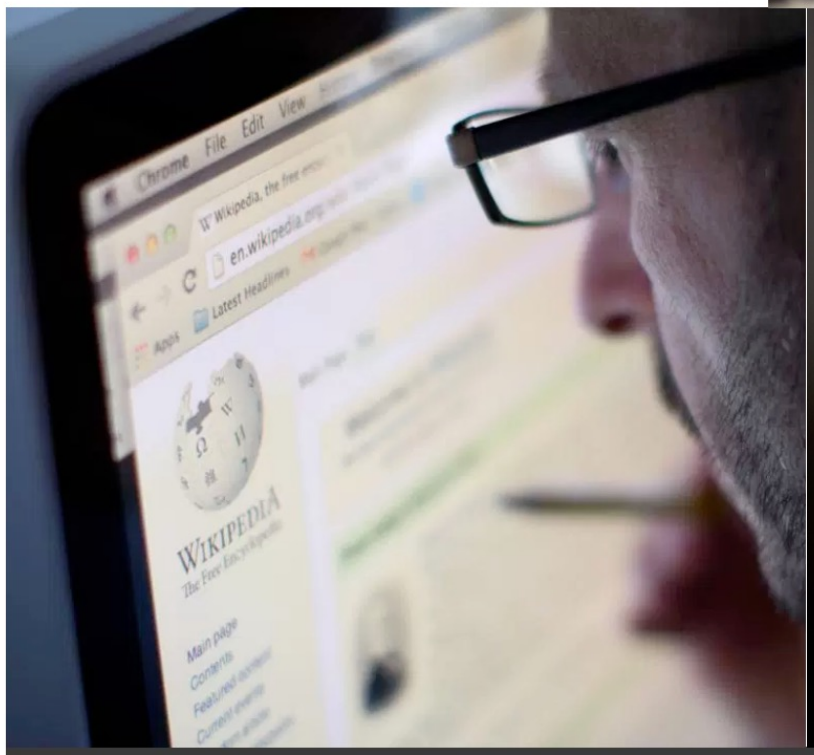


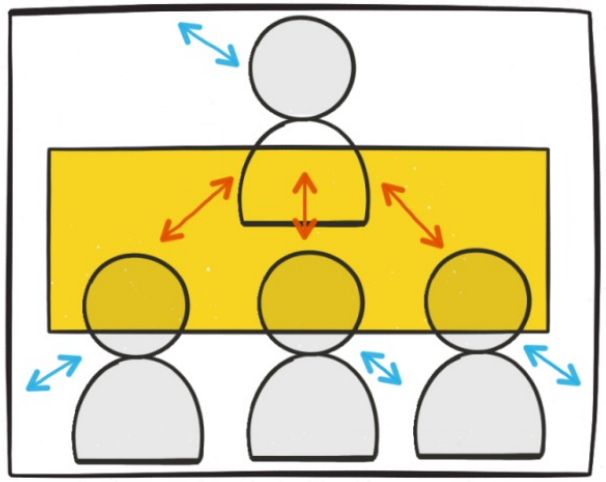
CSCW and CMC



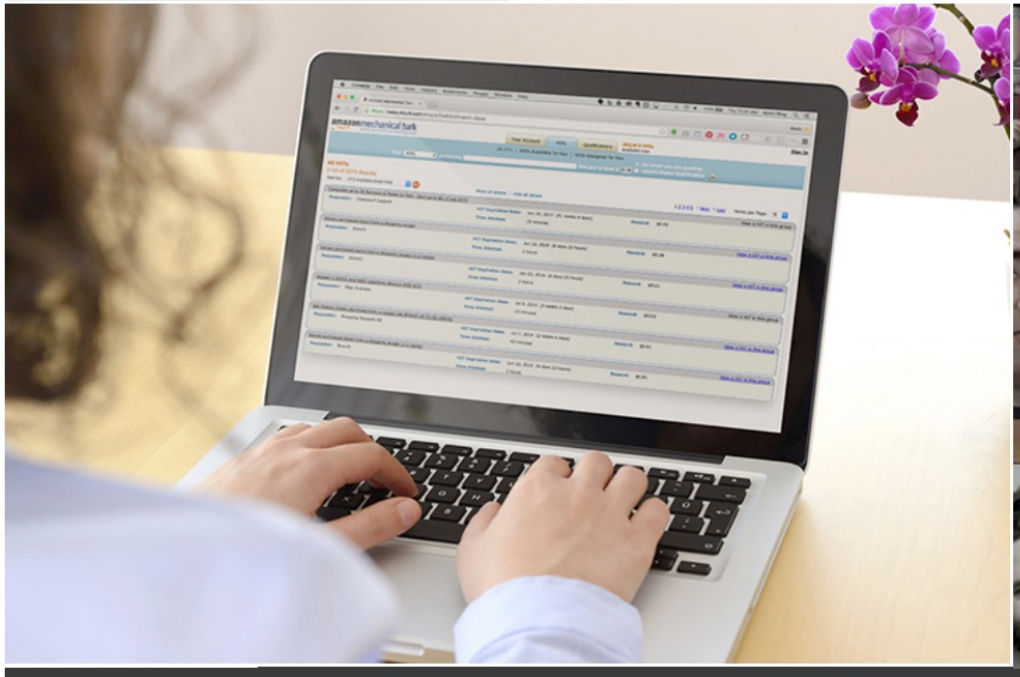
Social Computing

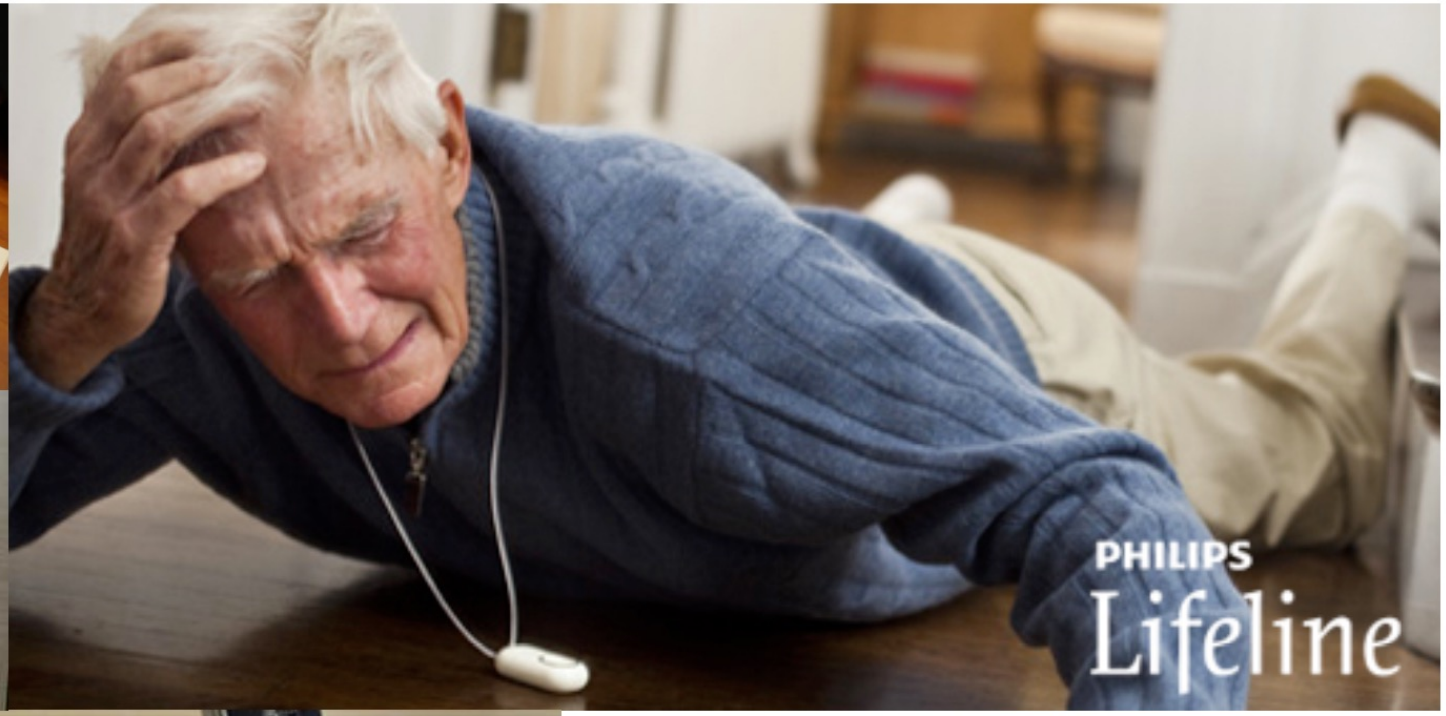


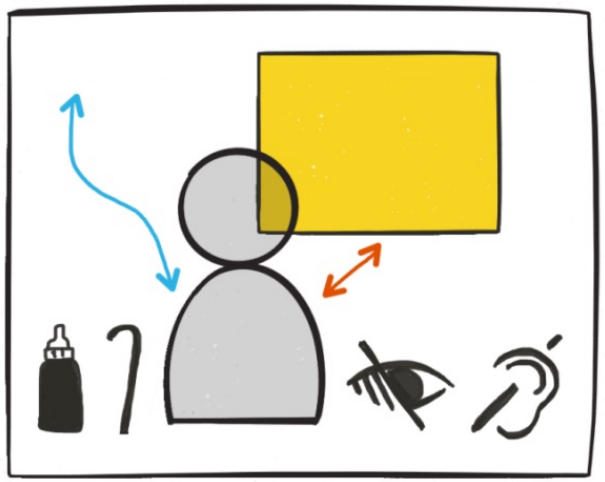




Crowd Computing

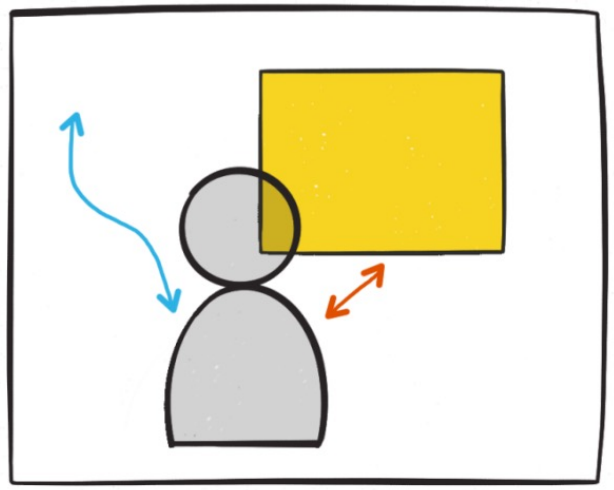




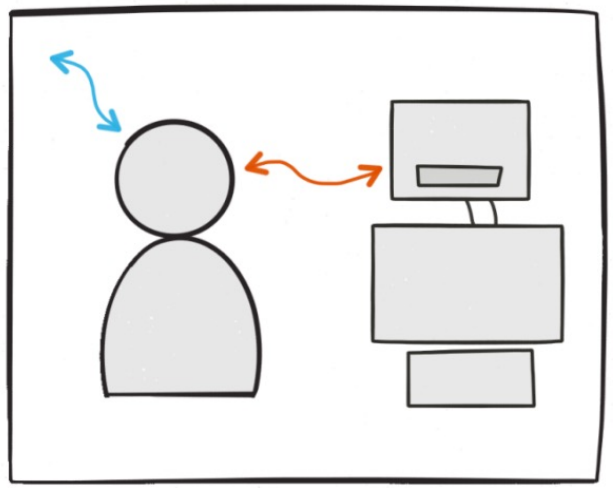


Persuasive and Assistive Technology

Interaction in New Paradigm – Connecting with AI and IA

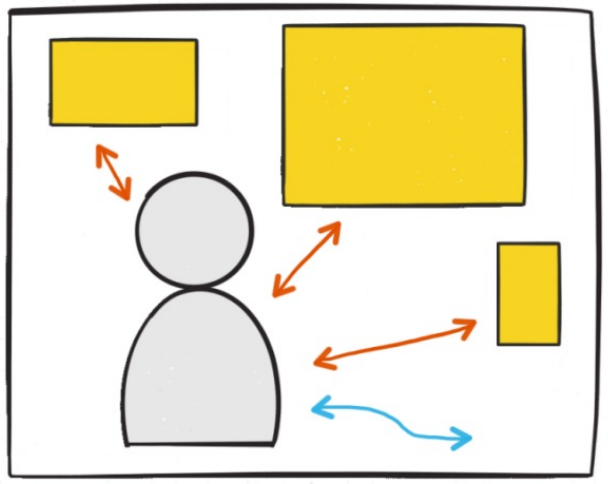


Interaction Techniques

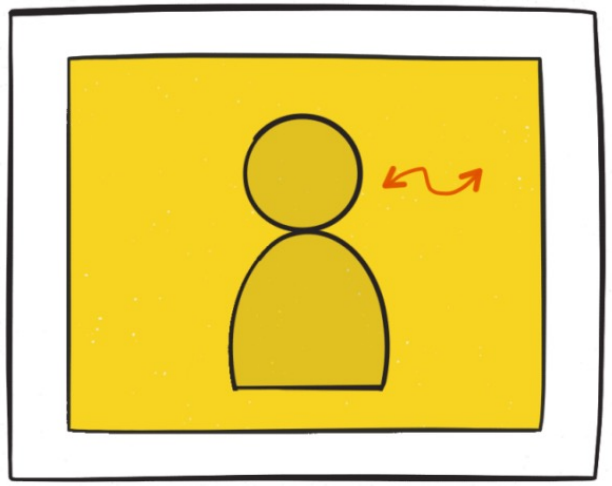


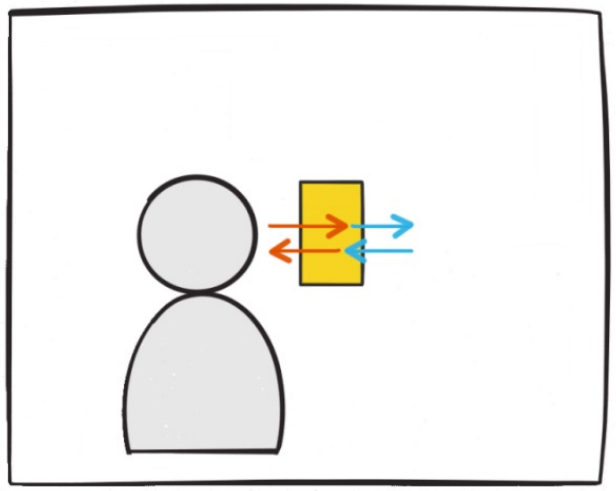
Human-Robot Interaction

Interaction Anywhere Any Time – Connecting through Devices



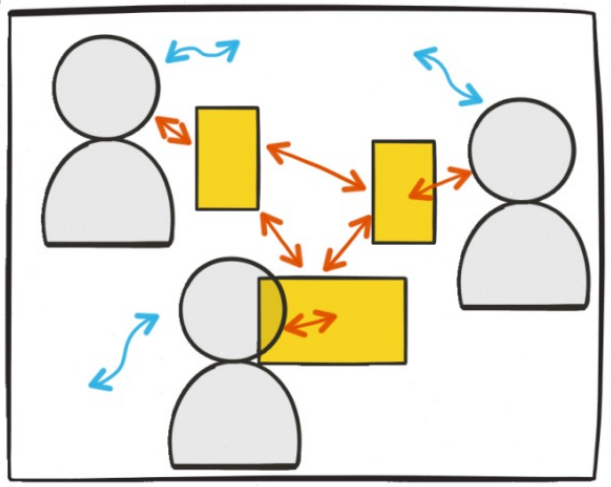
Ubiquitous Computing



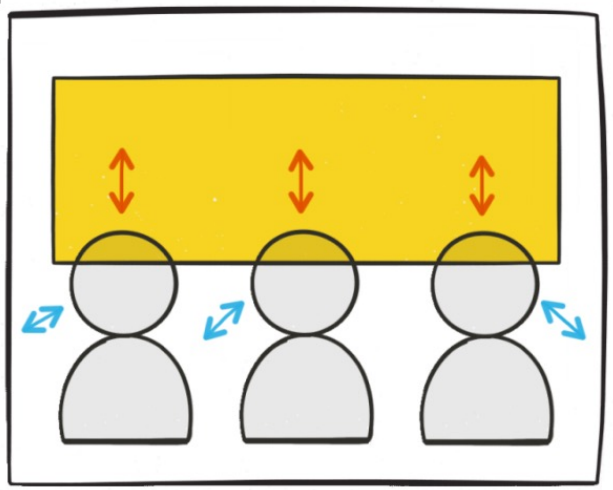


Virtual Reality, Augmented Reality, & Games

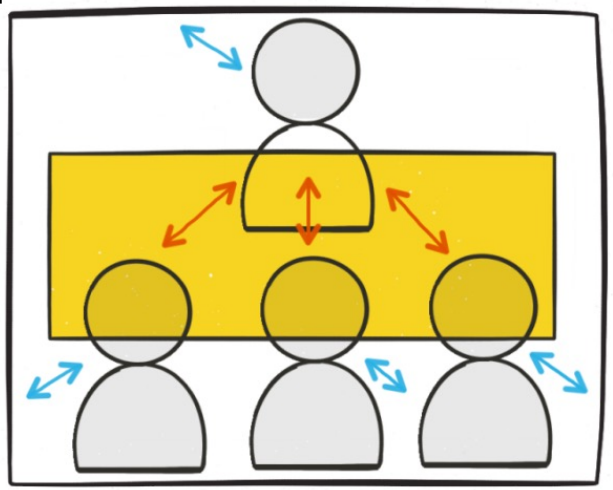
Interaction beyond the Individual – Connecting with People



CSCW and CMC

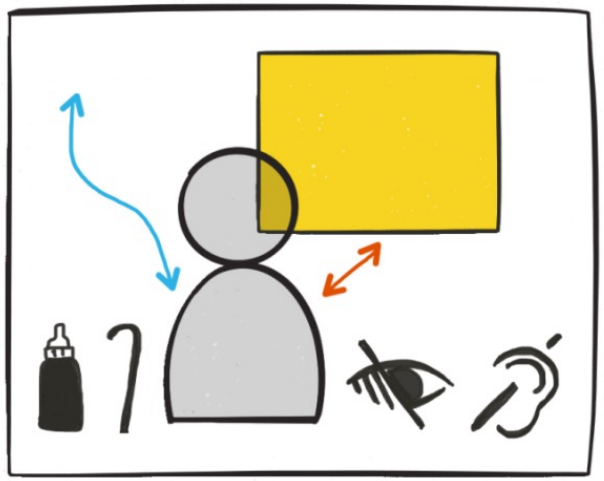


Social Computing

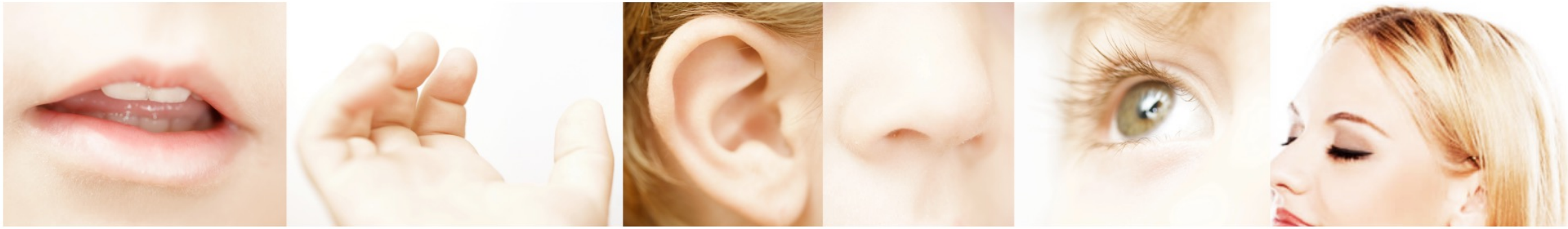


Crowd Computing

Interaction for good – Connecting with Human Future



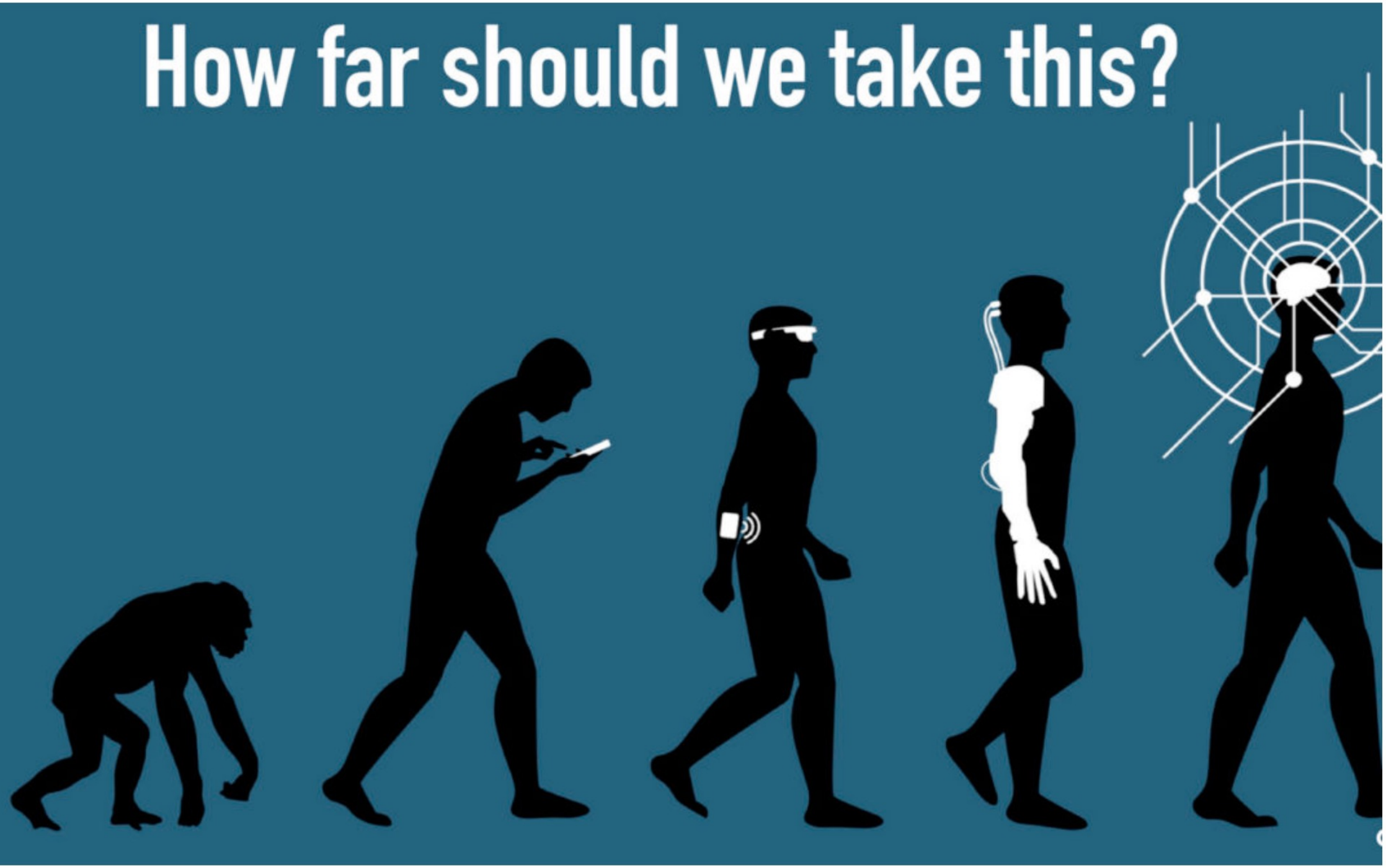
Persuasive Technology and Assistive Technology



- Hot Topics in HCI
  - Interaction in new paradigm
  - Interaction anywhere any time
  - Interaction beyond the individuals
  - Interaction for good

Recap

- Three Waves of HCI
  - Classic: information systems
  - Modern: interpreter / predictor
  - Contemporary: situated actors
- This Course Covers
  - Fundamentals
  - Principles, processes, and tactics
  - Hot topics


How far should we take this?

If you are interested in HCI
and want to collaborate with me,
please contact me!
Thanks!

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pengzhh29@mail.sysu.edu.cn

Acknowledgement: Some materials are collected from Prof. Xiaojuan Ma's HKUST COMP 4461 "Human-Computer Interaction".