

Prof. Dr. Gerhard Leitner

# Star Trek and the Workplace of the Future – what we can learn to improve our Digital Life on Campus



FAKULTÄT FÜR TECHNISCHE WISSENSCHAFTEN



22<sup>nd</sup> INTERNATIONAL HERUG CONFERENCE 2019 at TU BERLIN  
Wednesday, May 15 – Friday, May 17, 2019

## Digitize the Campus

Universities are communities, comparable to small towns or districts (**or Starships and Space Stations**).

**Smart City solutions** and the **Internet of Things** should also be used on campus.

**Networking of local and global groups** in research and teaching is progressing dramatically and that **physical and virtual infrastructures** are merging.

What significance do the technologies (**AI/ML, Big Data and IoT...**) have and are there already applications in the HER area?

How can **mobile apps** support the communities of teaching, learning and research with personalised information and services?

**What else? And what does this have to do with Star Trek?**

Our sad reality...

NO SIGNAL

What if this happened in Star Trek?



The reaction would probably be like this...



## Motivation: Science Fiction vs. Fact

### The Computer of the 21<sup>st</sup> Century (1991)

The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.

### The age of Interruption (2006)

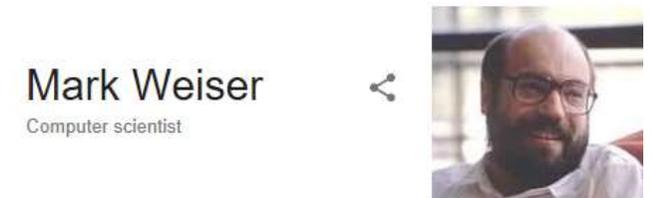
it is the malady of modernity. We have gone from the Iron Age to the Industrial Age to the Information Age to the Age of Interruption.

All we do now is interrupt each other or ourselves with instant messages, e-mail, spam or cellphone rings. Who can think or write or innovate under such conditions? One wonders whether the Age of Interruption will lead to a decline in civilization — as ideas and attention spans shrink and we all get diagnosed with some version of Attention Deficit Disorder.

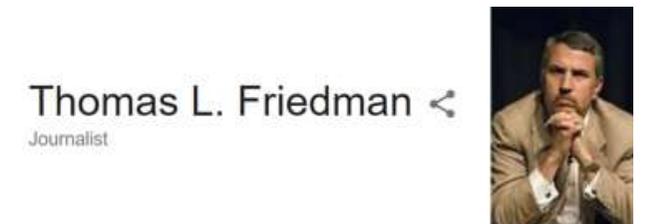
-> In Star Trek, technology “weaves itself” into daily life.

-> In our Reality, technology is interruptive.

What is the relation to Usability Engineering (UE) and User Experience (UX)?



Mark D. Weiser was a computer scientist and chief technology officer at Xerox PARC. Weiser is widely considered to be the father of ubiquitous computing, a term he coined in 1988. [Wikipedia](#)

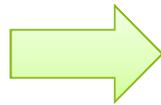
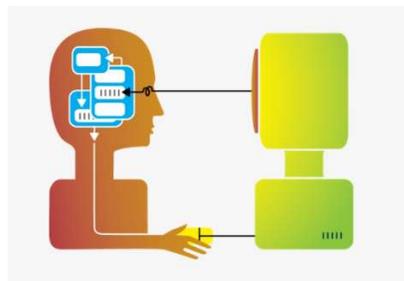


Thomas Loren Friedman is an American political commentator and author. He is a three-time Pulitzer Prize winner. Friedman currently writes a weekly column for The New York Times. He has written extensively on foreign affairs, global trade, the Middle East, globalization, and environmental issues. [Wikipedia](#)

## UE and UX - What's the difference?



One of the problems: The situation has changed...



...but has our understanding, too?

***The old computing is what computers can do,  
The new computing is about what people can do***

**Ben Shneiderman, Leonardo's Laptop**

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## What can we learn?

### Examples:

Antoine Geiger – mobile devices „sucking“ our mind

Awareness campaign of KfV\* – cushions on lamp posts

In the lecture room – Students watching videos instead of following the lecture

**Star Trek technology is designed as a tool to support tasks and allows people (users) to concentrate on the things they have to (or want) to do**

**State-of-the-art technology is in the focus, disruptive attracting attention, leads to high efforts and is distracting from real tasks**



\*Austrian Board of Traffic Safety

© <https://antoinegeiger.com/SUR-FAKE>

APA / Helmut Fohringer <https://wien.orf.at/news/stories/2862164/>

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# Examples for Potentials and Relations to Star Trek



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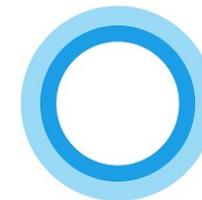
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## Star Trek and Current developments



Technologies to support human abilities and make interaction more natural are already on the rise:

Alexa<sup>©</sup>, Siri<sup>©</sup>, Cortana<sup>©</sup>



But also other technologies would be also available...

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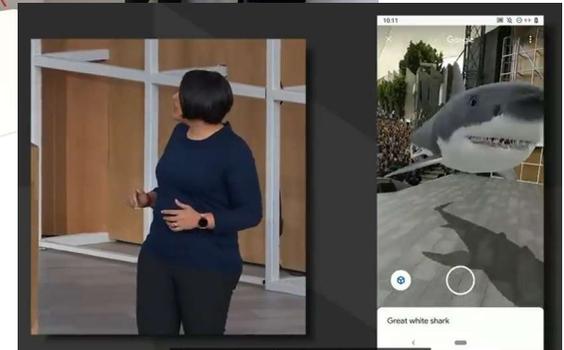
## Potentials - To ease communication / conversation: Instant Translation



English to Japanese translation in Tokyo Underground

Copyright Ili – © [https://www.youtube.com/watch?time\\_continue=3&v=rliGyn\\_Hfcl](https://www.youtube.com/watch?time_continue=3&v=rliGyn_Hfcl)

## Potentials - To make lectures more interesting: Augmented Reality



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## Potentials - Standard lectures: Could AI and /or Humanoid Robots do them?



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## Potentials - Meetings / Lectures / Conferences: Holography as an Alternative



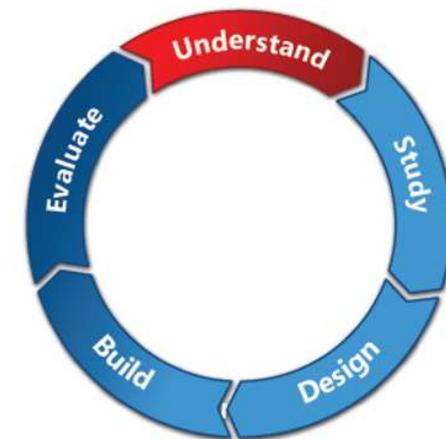
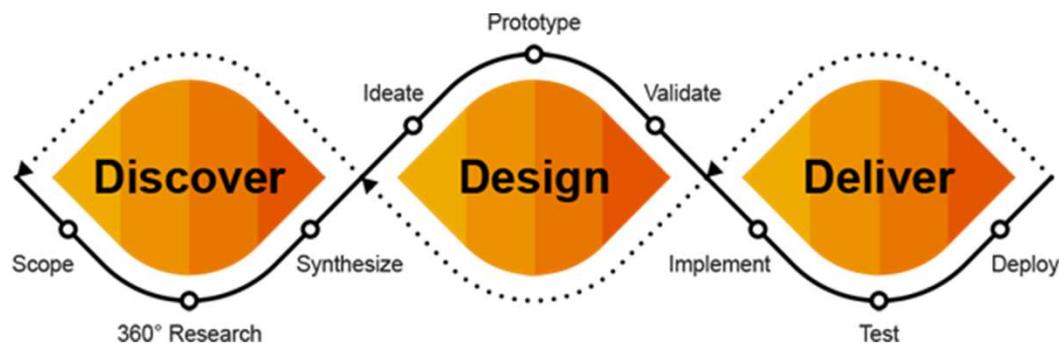
Star Trek Holodeck and  
„The Doctor“ – Holographic Avatar Star Trek Voyager

Large Sized 3D Holographic Projection at Medical Conference 2013  
State of the Art Skype Conference (Klagenfurt 2019)

## Connection to SAP – e.g. Design Thinking

*We are using Design Thinking to **gain empathy** for our customers and help you **realize your future through technology** so we can help the world run better and **improve people's lives**.*

BILL MCDERMOTT  
SAP SE Chief Executive Officer



Extended User Centered Design Model

## Challenges to overcome - Example: Automatic Context Adaption (e.g. Commuting)

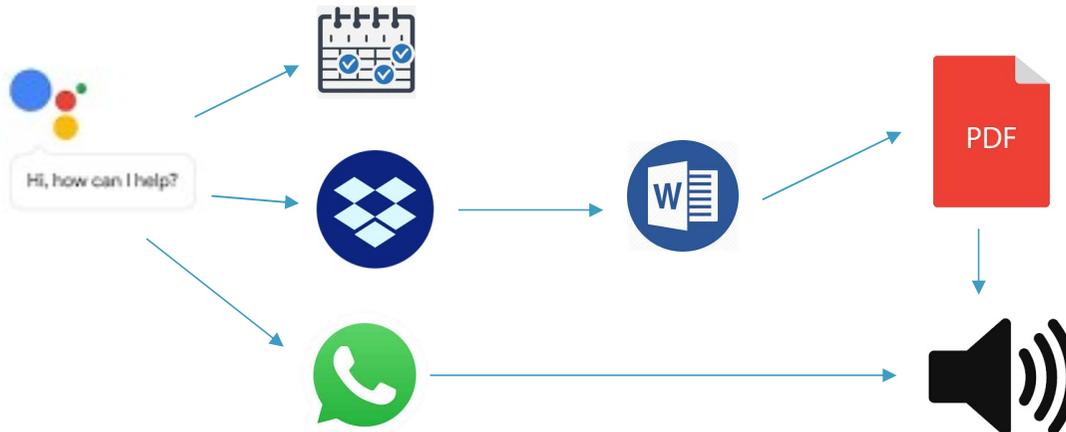
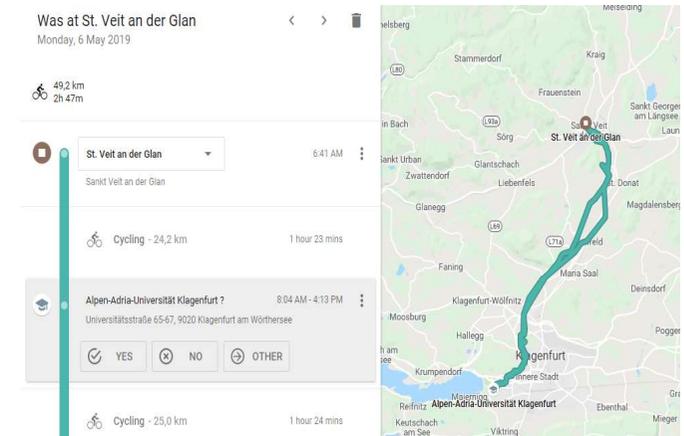
In Star Trek, technologies are instantly adapted to actual needs (and interaction abilities that are available)

Our technologies, such as smart phones - are not adaptive, however, can be „tuned“ - with efforts

Commuting / Leisure could be productively used, but what if:

... hands are not free to operate smart phone?

... space does not allow „standard“ interaction?



## Challenges to overcome – Example: Easier access to diagnosis / analysis features



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## First Steps we have made- AI based tools

Eduroam



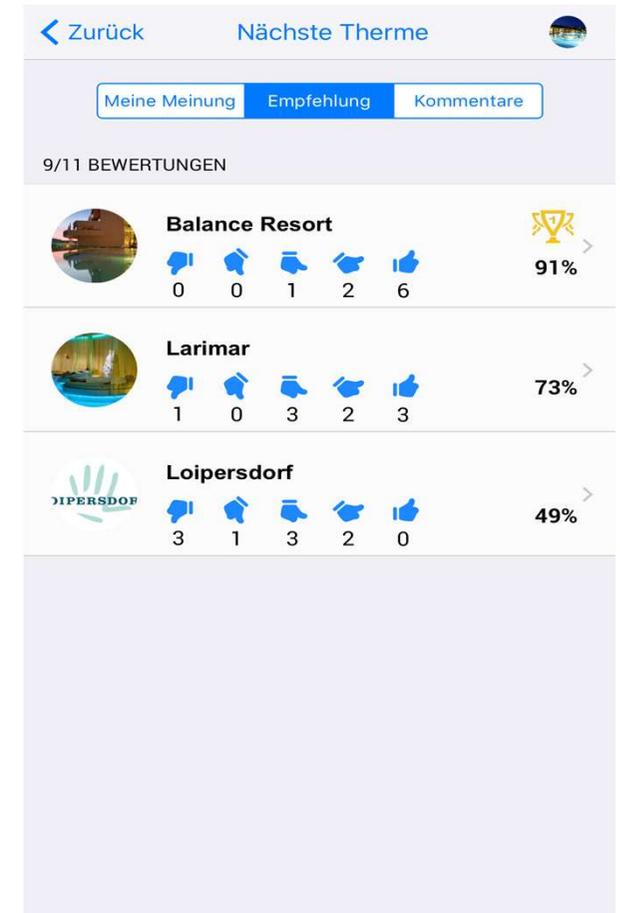
Interactivity / Decision Support : Choicla Web



Gamification / Training: KnowledgeCheckR



Enhancing Comfort – Integration: EventhelpR

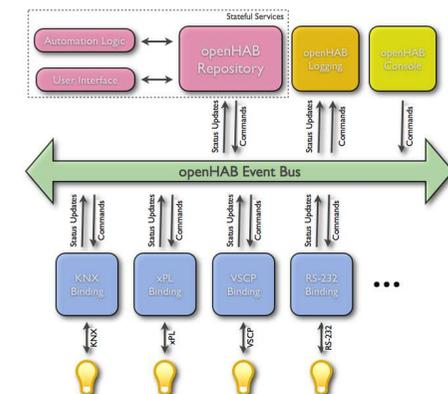
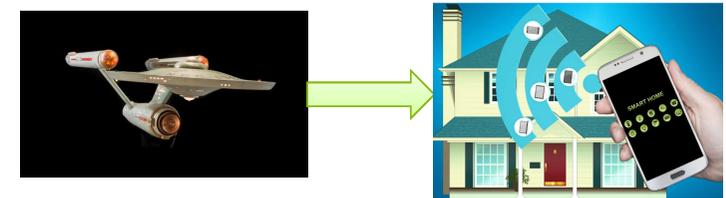


ChoiclaWeb

[www.Choiclaweb.com](http://www.Choiclaweb.com)

Key: 8yzpM

## Urgently Needed: Integration: Example from the Smart Home Domain - Openhab



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<https://www.openhab.org/blog/2017-01-22-openhab2.html>, © Brand owners

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<https://www.publicdomainpictures.net/en/view-image.php?image=273147&picture=smart-home-technology>

And Finally: Food Replication – would be great!



We're on the way ;-)

## Summary

Technologies similar to those shown in the Star Trek series are already available

The main difference between Science Fiction and reality is that it is still the task of us users to configure and adapt the technologies to our needs. Based on knowledge, motivation and abilities this can be a difficult (or even unsolvable) task

It is important to change the basic mindset, taking into account both the vision of HCI, according to which technology has to adapt to users not the other way round and the potentials of the vision of Mark Weiser illustrated in Star Trek, where technology weaves itself into life so that it is indistinguishable from it.

# Thank you for your kind attention!



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