UiO : Universitetet i Oslo

interaksjon #1: kunstig intelligens & roboter – om autonome systemer

Tone Bratteteig

in1060: 30/3 2020

pensumartikler:

- Lars Erik Holmquist: *Intelligence on Tap: Artificial Intelligence as a New Design Material*

- Rebekka Soma & Jo Herstad: *Turning Away from an Anthropocentric View on Robotics*
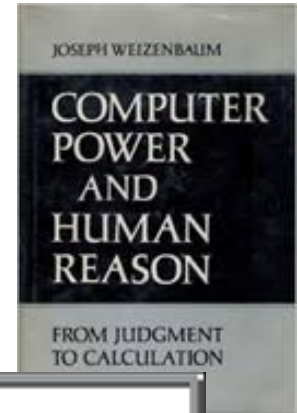
kunstig intelligens

kunstig intelligens / artificial intelligence (AI):

teknologi som observerer omgivelsene, tar avgjørelser og justerer sin egen aktivitet på en måte som fremstår som intelligent

f.eks.

ved å lage regler for en beslutning

Veileder for lån fra Husbanken
Husbanken

ELIZA

JOSEPH WEIZENBAUM

COMPUTER
POWER
AND
HUMAN
REASON

FROM JUDGMENT
TO CALCULATION

```
> Hello, I am Eliza.
* I am afraid.
> How long have you been afraid?
* Since midterms.
> Tell me more...
* I am afraid that I will fail
my course.
> Do you enjoy being afraid that
you will fail your course?
```

kunstig intelligens: maskinlæring

maskinlæring / machine learning (ML):

teknologi som bruker algoritmer og statistiske modeller til å utføre oppgaver basert på analyse av data, dvs. mønstre og slutninger fra daya og ikke pre-definerte instruksjoner

- analyserer mye data (big data)
- bruker mange lag med statistikk
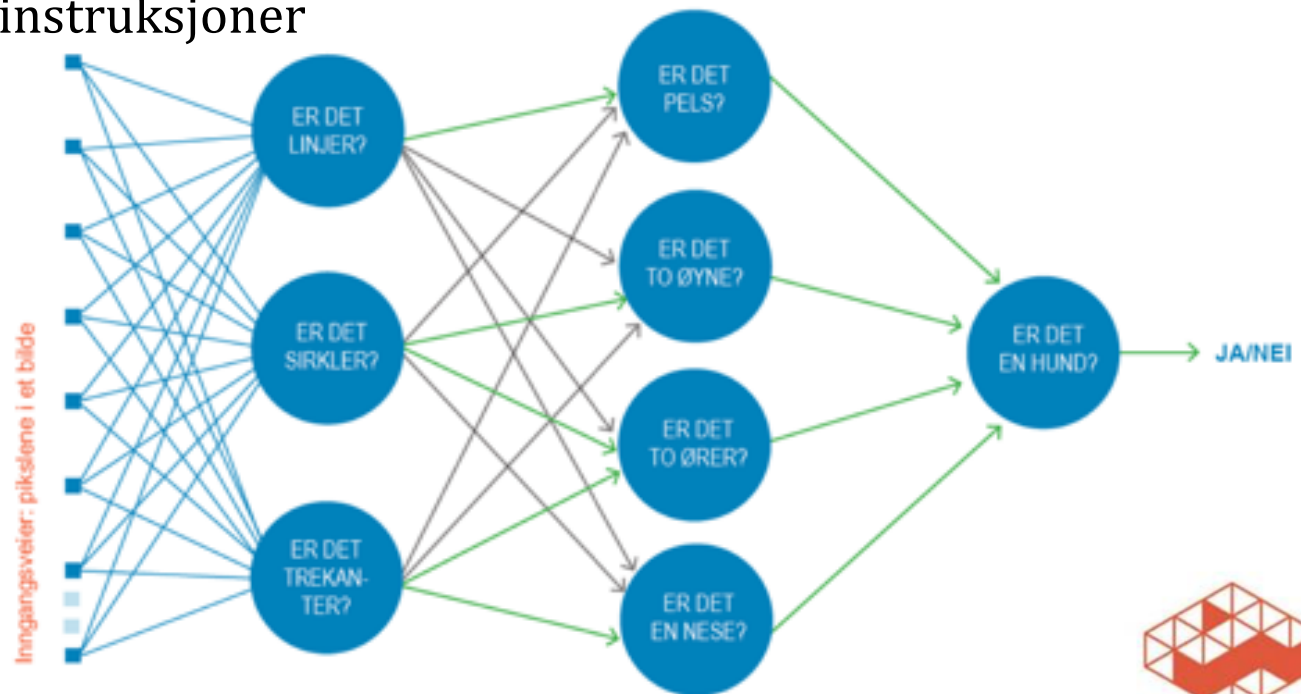
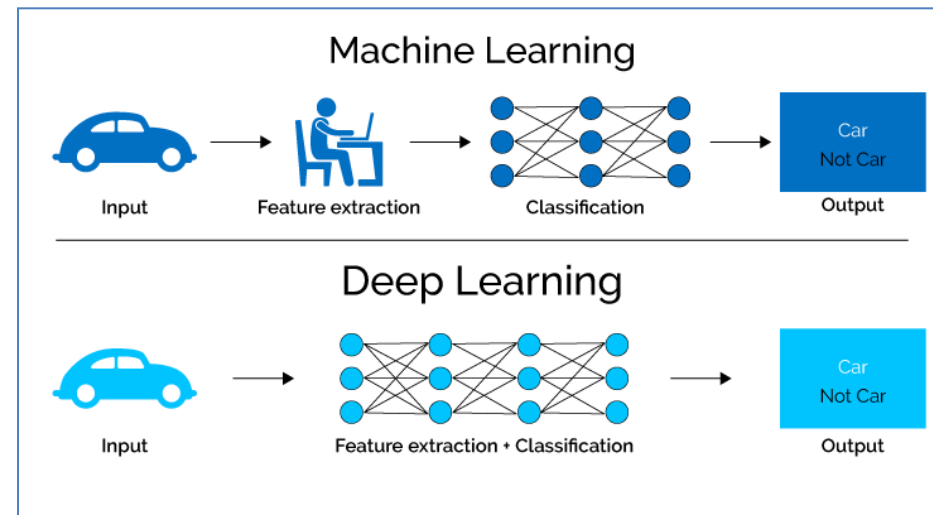Figur 2: Skjematisk illustrasjon av et nevralt nett[9]

Teknologirådet

kunstig intelligens: maskinlæring

maskinlæring / machine learning (ML):

teknologi som bruker algoritmer og statistiske modeller til å utføre oppgaver basert på analyse av data, dvs. mønstre og slutninger fra daya og ikke pre-definerte instruksjoner

- analyserer mye data (big data)
- bruker mange lag med statistikk

- "lærer" av alle nye data
- beslutning kan ikke spores

kunstig intelligens: maskinlæring

kunstig intelligens: maskinlæring

Google Home

Several products released under the original Google Home moniker: Google Home, Google Home Hub, and Google Home Mini

Developer	Google
Type	Smart speaker
Release date	November 4, 2016; 3 years ago
Units sold	14 million (US)[1]
CPU	Home: Marvell 88DE3006 Armada 1500 Mini Plus dual-core ARM Cortex-A7 media processor[2]
Input	Voice commands, limited physical touch surface
Connectivity	Wi-Fi dual-band (2.4/5 GHz) 802.11b/g/n/ac,[3] Bluetooth

Amazon Alexa

Amazon Alexa, known simply as Alexa, is a virtual assistant AI technology developed by Amazon, first used in the Amazon Echo smart speakers developed by Amazon Lab126. Wikipedia

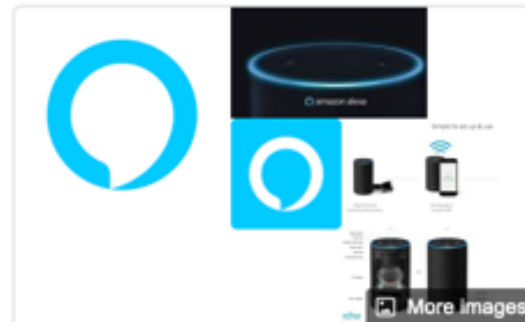**Operating system:** Fire OS 5.0 or later, iOS 11.0 or later; Android 4.4 or later

Developed by: Amazon.com

Initial release date: November 2014

Available in: English Language, French language, MORE

Platforms: Amazon Echo, Fire OS, iOS, Android, Cortana, Linux

People also search for · View 15+ more

Siri · Cortana · Bixby · HomeKit · Spotify

Siri

When is the Seahawks' next game
Tap to Edit

The Seahawks battle the Titans for Monday at 6:05:

SPORTS

Seahawks Schedule

Seahawks @ Titans
Mon, 25 Sep 2017 6:05 am · TV: FOX

Seahawks 1-1 · VS · Titans 1-1
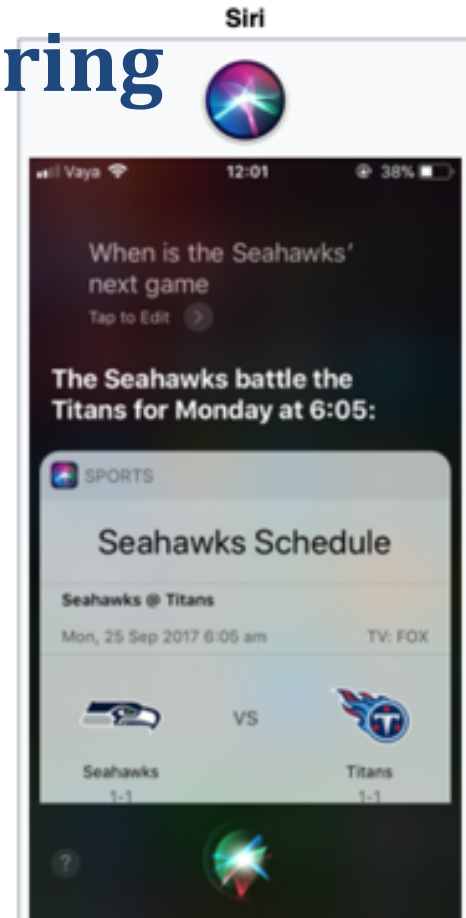
Siri dictates the next game for the Seattle Seahawks, upon the user's request, on an iPhone SE running iOS 11

Developer(s)	Apple
Initial release	October 12, 2011; 8 years ago
Operating system	iOS 5 onward, macOS Sierra onward, tvOS (all versions), watchOS (all versions), iPadOS
Platform	iPhone iPad iPod Touch

Tone Bratteteig, in1060: 30/3 2020

kunstig intelligens som designmateriale

kunstig intelligens som designmateriale

- må vite hva materialet kan gjøre og ikke:
  muligheter og begrensninger
  (slik som andre designere må kunne
  mye om tre, plast, metall, papir …)

A CAPTCHA is a type of challenge–response test used in computing to determine whether or not the user is human. The term was coined in 2003 by Luis von Ahn, Manuel Blum, Nicholas J. Hopper, and John Langford. The most common type of CAPTCHA was first invented in 1997 by two groups working in parallel. Wikipedia

Robot ansatt som butikkmedarbeider – fikk sparken etter én uke

1 min Publisert: 25.01.18 – 06.10 Oppdatert: 2 år siden

Den menneskelignende roboten var av typen «Pepper», som er utviklet i Japan av Softbank. De ansatte i Marg butikken bestemte seg imidlertid for å kalle sin nye kollega for Fabio, og flere ansatte ble knyttet til roboten, s sparken etter bare en uke på jobb. (Foto: BENOIT TESSIER/Reuters/NTB scanpix)

Dagens Næringsliv

D et har vært skrevet mye om at roboter vil overta mange av jobbene våre. Google og McKinsey hevdet nylig at kjedelige, farlige og forurensende jobber vil forsvinne og overtas av maskiner.

Mange har også kommet med advarsler om hva fremveksten av roboter og kunstig intelligens vil innebære. Grunnlegger av den japanske telekomgiganten Softbank, Masayoshi Son, advarer om at det vil være like mange superintelligente roboter som mennesker på kloden om 30 år, og at mange vil være smartere enn mennesker.

I fjor sommer advarte Tesla-gründer Elon Musk om at kunstig intelligens utgjør en

kunstig intelligens som designmateriale

Holmquist om utfordringer fra AI/KI er å designe for

1)gjennomsiktighet *(at brukeren må forstå at systemet tar egne beslutninger på bakgrunn av nye input data fra brukeren)*

2)skjult rasjonale *(det er ikke mulig å forklare systemets handlinger)*

3)uforutsigbarhet *(ML trekker egne konklusjoner (fx lære GO))*

4)kontinuerlig læring *(all bruk er læring (fx capcha & stavekontroll))*

5)kontinuerlig utvikling *(forbedring kan innebære forandring som systemet initierer (fx morgenkaffe til nytt tidspunkt))*

6)dele kontroll med bruker *(må vise fordeling av kontroll & kunne gi bruker full kontroll over beslutning & utvikling)*

+

a)etikk og ansvar *(hvem er ansvarlig? (fx selvkjørende bil))*

b)hvem eier data om deg *(du, den som samler, lagrer, eier program ..)*

c)forstå design materialet *(statistikk er vanskelig, "data is king")*

Holmquist side 32

They include:
• Designing for transparency
• Designing for opacity
• Designing for unpredictability
• Designing for learning
• Designing for evolution
• Designing for shared control.
The first challenge means that it is necessary to let the user understand

roboter – fysiske, bevegelige, autonome

- har fysisk utstrekning
- situert (tilstede over tid)
- kan bevege seg

- hvordan forstår den verden?
(fx kamera forstår ikke det det tar bilde av)

Turning Away from an Anthropocentric View on Robotics

Rebekka SOMA[a,1], Jo HERSTAD[a]
[a]*Department of Informatics, University of Oslo, Norway*

Abstract. The field of artificial intelligence and robotics has long adapted an anthropocentric view, putting the intelligence structures of humans as the guiding requirements for developing artificial intelligence. This paper use observations of a robotic lawnmower to demonstrate how we can apply Jakob von Uexküll's Umwelt theory to describe robots and robot behavior to further our understanding of the behavior of different kinds robots.

Keywords. Human-robot interaction, robots, Umwelt theory, phenomenology, artificial intelligence

1. Introduction

From the start of artificial intelligence and through to today the milestones for judging whether we have created something intelligent has been tied to human intelligence and human activities, such as language and games. Nietzsche wrote that there once was a star on which "clever animals invented knowledge", but that only we, the owners of the human intellect "gives it such importance, as if the world pivoted around it" [1]. In light of this observation, it is not all that strange for humans to set the criteria to human standards of what we consider traits of higher intelligence, after all we project our own world views into most things [2, 3]. At first glance, it would seem apparent that we should create AI in our perceptual image; after all, many are created with the intent of assisting us.

In the 1980s Moravec [4] introduced the notion that robotics and artificial intelligence could learn from nature and evolution. He points out how problem-solving AI's easily mimic competent adult humans, yet robotic systems rarely achieved the bodily coordination of a four-year-old child. This, he argues, is because there is a qualitative
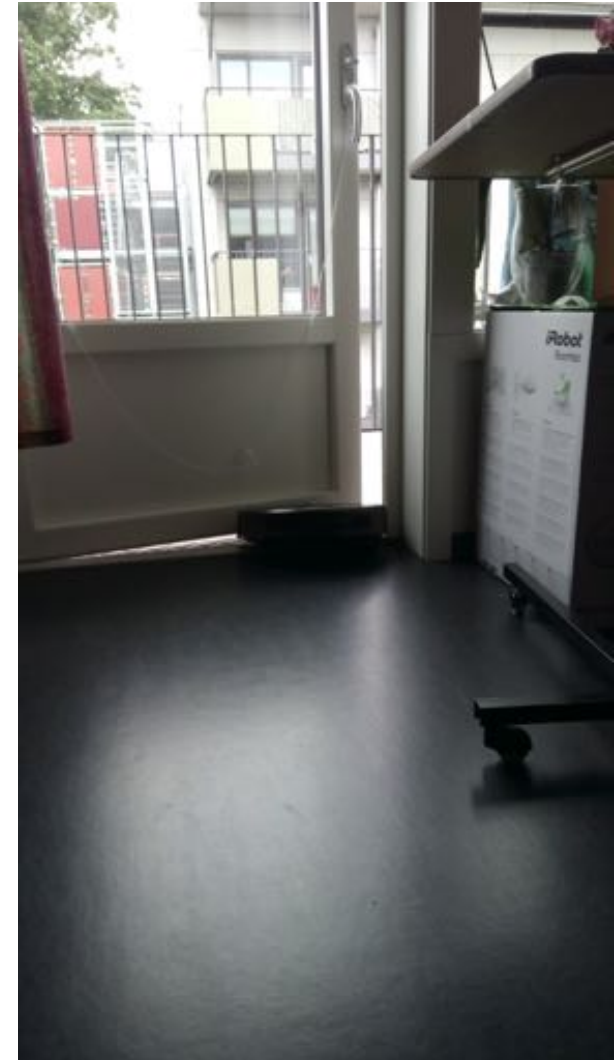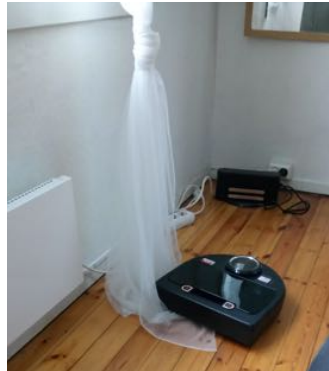
Diana Saplacan (PhD)

omverden – oppfattet-rom & handlingsrom

- omverden (Umwelt)

- oppfattet-verden (Merkwelt)

- handlings-verden (-rom) (Wirkwelt)

Freiherr
Jakob von Uexküll

Jakob Johann von Uexküll, 1903

Born	8 September [O.S. 27 August] 1864
	Keblas Manor [et], Sankt Michaelis, Wiek County, Governorate of Estonia, Russian Empire
	(in present-day Mihkli, Pärnu County, Estonia)
Died	25 July 1944 (aged 79)
	Capri, Kingdom of Italy
Nationality	Baltic German

Figure 1. A meadow in a human Umwelt (left) and the same meadow in a bee Umwelt (right) [7, p. 351].

illustrasjon av bienes omverden

omverden – oppfattet-rom & handlingsrom

- omverden (Umwelt)
- oppfattet-verden (Merkwelt)
- handlings-verden (-rom) (Wirkwelt)

Figure 1. A meadow in a human Umwelt (left) and the same meadow in a bee Umwelt (right) [7, p. 351].

illustrasjon av bienes omverden

Rebekka:
tigerens byttedyr ser i svart-hvitt

omverden – oppfattet-rom & handlingsrom

- omverden (Umwelt)

- oppfattet-verden (Merkwelt)

- handlings-verden (-rom) (Wirkwelt)

Tick (Flått)

Animal

Scientific name: Ixodida

Rank: Order

Higher classification: Parasitiformes
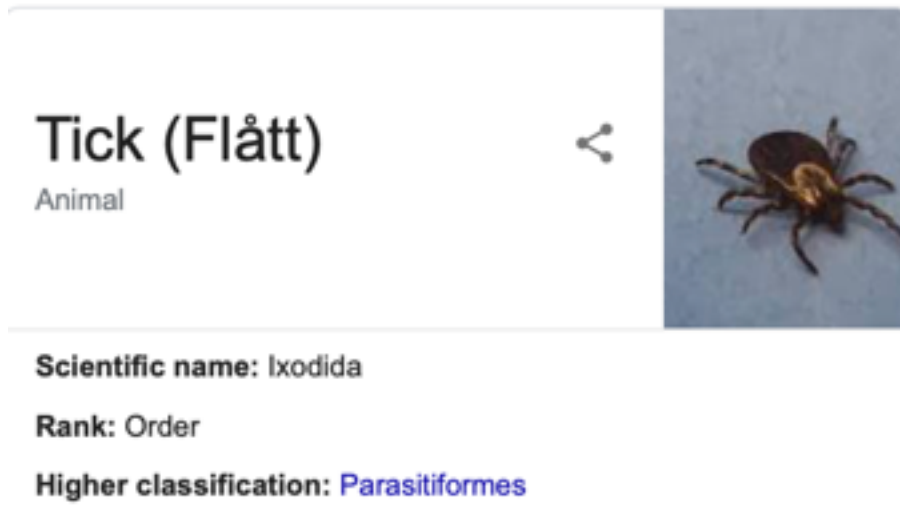
- omverden (Umwelt)

- oppfattet-verden (flått-ting)

  - *lukter stoff hos pattedyr (blind)*

  - *kjenner varm landingsplass*

  - *kjenner varm væske (blod)*

- handlings-verden

  - *hoppe når kjenner riktig lukt*

  - *bite når varm landingsplass*

  - *legge egg når varm væske*

roboter – fysiske, bevegelige, autonome

- hva er robotens omverden?
- hva er dens oppfattet-verden
  (hva kan den sanse?)
- hva er dens handlingsverden
  (hva kan den gjøre?)

Turning Away from an Anthropocentric View on Robotics

Rebekka SOMA[a,1], Jo HERSTAD[a]
[a] *Department of Informatics, University of Oslo, Norway*

Abstract. The field of artificial intelligence and robotics has long adapted an anthropocentric view, putting the intelligence structures of humans as the guiding requirements for developing artificial intelligence. This paper use observations of a robotic lawnmower to demonstrate how we can apply Jakob von U... theory to describe robots and robot behavior to f...
havior of different kinds robot...

Keywords. Human
ficial intelligence

1. Introduction

From the start of artificial in...
whether we have created son...
human activities, such as lang...
on which "clever animals inve...
man intellect "gives it such im...
this observation, it is not all tha...
of what we consider traits of hig...
into most things [2, 3]. At first g...
in our perceptual image; after al...

In the 1980s Moravec [4] in...
gence could learn from nature an...
easily mimic competent adult hu...
coordination of a four-year-old ch...

Adapting to a Robot
Adapting Gardening and the Garden to fit a Robot Lawn Mower

Guri B. Verne
Department of Informatics
University of Oslo
Oslo Norway
guribv@ifi.uio.no

1 Introduction

Previous research has shown that introd...
home changes the work that is carried ou...
[8,10,19,24,25,26]. Forlizzi and DiSalvo [9]...
cleaning robot Roomba reduced cleanin...
people's cleaning work. Cleaning was tl...
week, but the Roomba can be active eve...
how the physical environment of the h...
Roomba was used, and the inhabitants...
taking clothes from the floor so the R...
study concludes that the homes and th...
to each other. The robot vacuum clean...
the traditional vacuum cleaner. Cle...
change to the degree that some pers...
to be not compatible with using a rob...
[8]. Cleaning robots 'elicit dynami...
space, household members, an...
relationships are inter-connected an...
p. 427]. Sung et al. [25, 26] argue...

ABSTRACT
Introducing robots into the home changes the work that the homeowners carry out. This paper explores in depth how garden work and the garden change when a robotic lawn mower is introduced. The methodology in this study is autoethnographic, which gives access to personal experiences and thoughts. The paper describes how the usual work of manually mowing the lawn is automated and new tasks emerge as the gardeners adapt to the robot mower. A conceptual framework is presented and used to analyse these changes. Some gardening tasks become redundant and new tasks appear, and a new urgency is added to some of the old tasks. In addition, awareness about the robot mower's movements is important to keep it active and avoid damage to the robot and things in the garden. The paper suggests that unwanted changes that become too demanding are important for user acceptance or rejection of robots in the home environment.

neste gang (etter påske):
Tangible Interaction (TI) + om interaksjon

tangible interaction & tangible user interfaces (håndgripelig, sansbare)

Getting a Grip on Tangible Interaction: A Framework on Physical Space and Social Interaction

Eva Hornecker
Interact Lab, University of Sussex
Falmer, Brighton BN19PF, UK
eva@ehornecker.de

Jacob Buur
MCI, University of Southern Denmark
6400 Sønderborg, DK
buur@mci.sdu.dk

ABSTRACT
Our current understanding of human interaction with hybrid or augmented environments is very limited. Here we focus on 'tangible interaction', denoting systems that rely on embodied interaction, tangible manipulation, physical representation of data, and embeddedness in real space. This synthesis of prior 'tangible' definitions enables us to address a larger design space and to integrate approaches from different disciplines. We introduce a framework that focuses on the interweaving of the material/physical and the social, contributes to understanding the (social) user experience of tangible interaction, and provides concepts and perspectives for considering the social aspects of tangible interaction. This understanding lays the ground for evolving knowledge on collaboration-sensitive tangible interaction design. Lastly, we analyze three case studies, using the framework, thereby illustrating the concepts and demonstrating their utility as analytical tools.

[34], 'tangible interacti...
interactions and digitally-...

While in traditional deskt...
a window through which ...
tangible interfaces we a...
itself. Designing tangib...
designing the digital bu...
interrelations within hybr...
new types of interaction ...
body, haptic, and spatial ...
HCI. As building upon us...
the real world lowers ...
embodiment of interacti...
bottleneck' of the keyboa...
systems is easily observa...
support of face-to-face s...
in a considerable number ...
scenarios [1, 7, 26, 31, 32...

Tone Bratteteig, in1060: 30/3 2020