



Designing Voice and Auditory Interaction

Introduction by Prof. Nitin Sawhney, Dept. of Computer Science, Aalto University, January 18, 2022



Designing Voice and Auditory Interaction

ELEC-E5531:
Speech & Language
Processing Seminar

Organized as a 5 ECTS seminar, with lectures, visitors, presentations by students and a multi-disciplinary, rapid prototyping project.

Duration: 18.01.2022 - 5.04.2022 (12 weeks)

Seminar Sessions: Tuesdays 14:00-16:00

Project/Tutorial Labs: Thursdays 11:00-12:00

Instructors

- Tom Bäckström (ELEC / SPA)
- Nitin Sawhney (SCI / CS)
- Koray Tahiroglu (ARTS / Media)

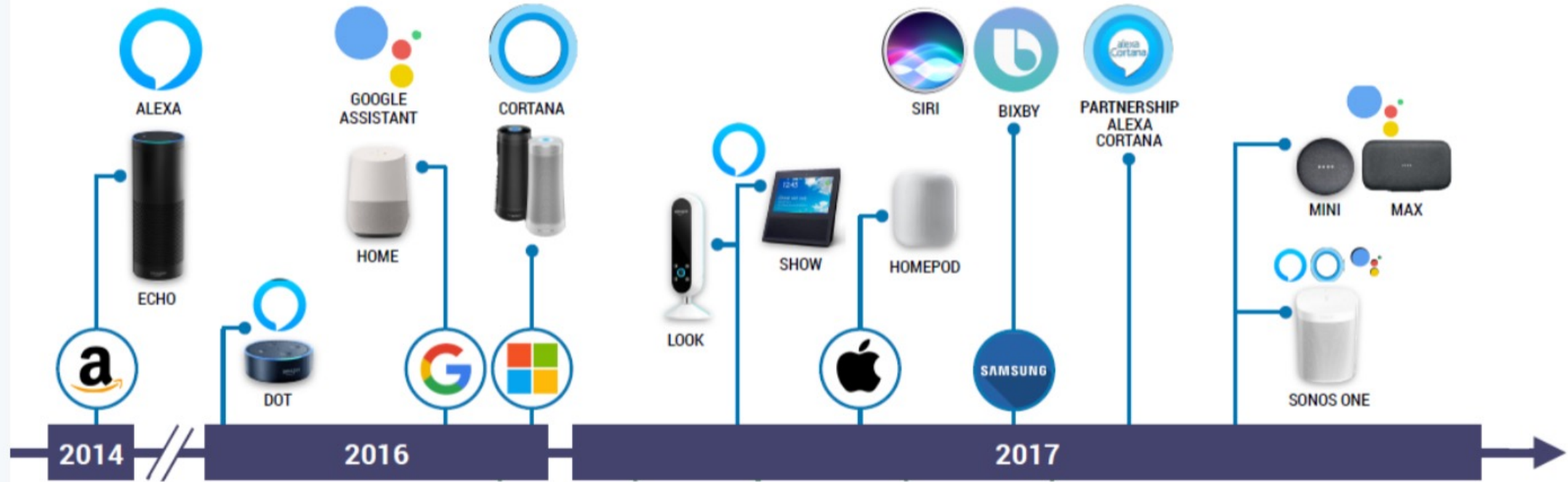
Teaching Assistants

- Kaisla Kajava (SCI / CS)
- Mohammad Vali (ELEC / SPA)
- Camilo Sanchez (ARTS / Media)

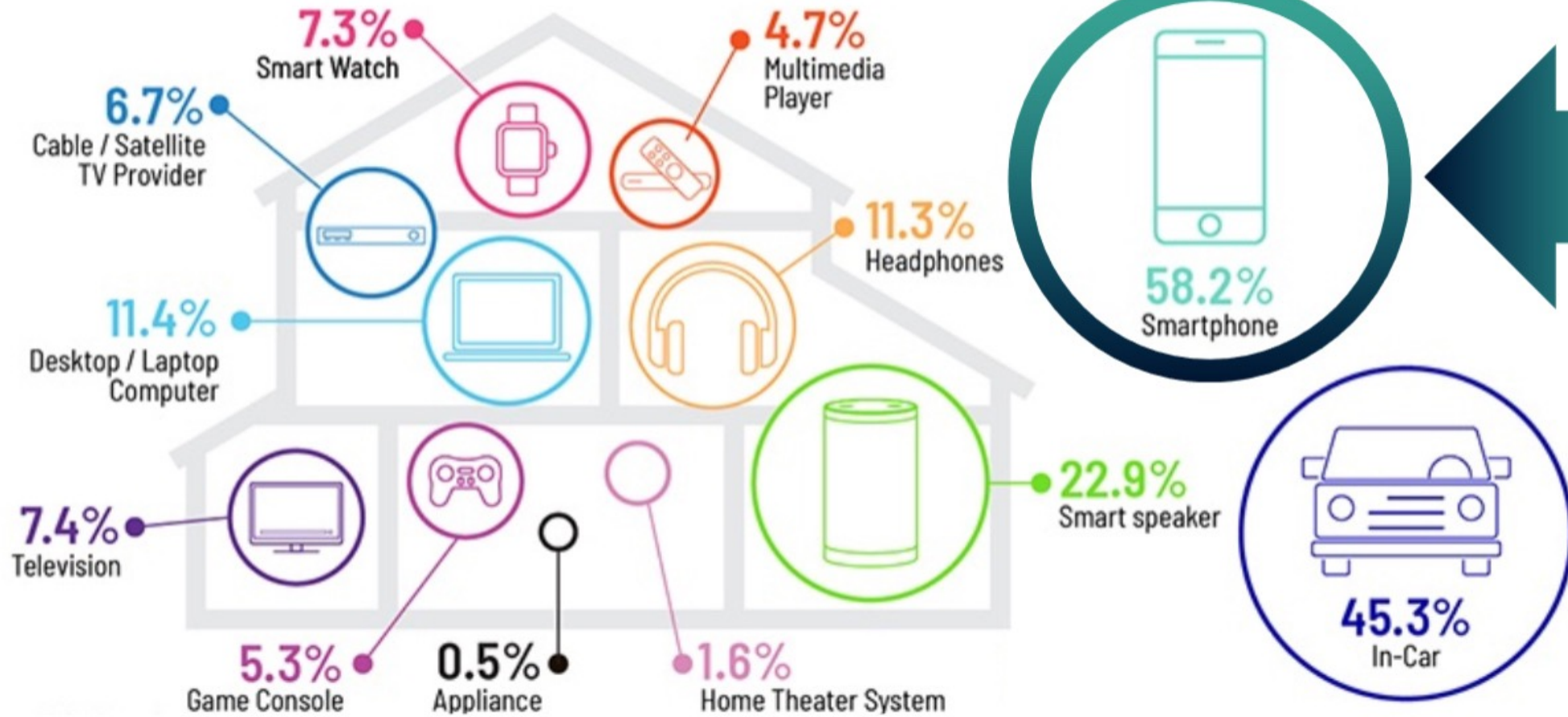
Proliferation of Voice Assistants in the past decade?



The Development of Voice Assistants



Use of Voice Assistants by Device



Source: Voicebot (2018)

#VoiceMeetupCH

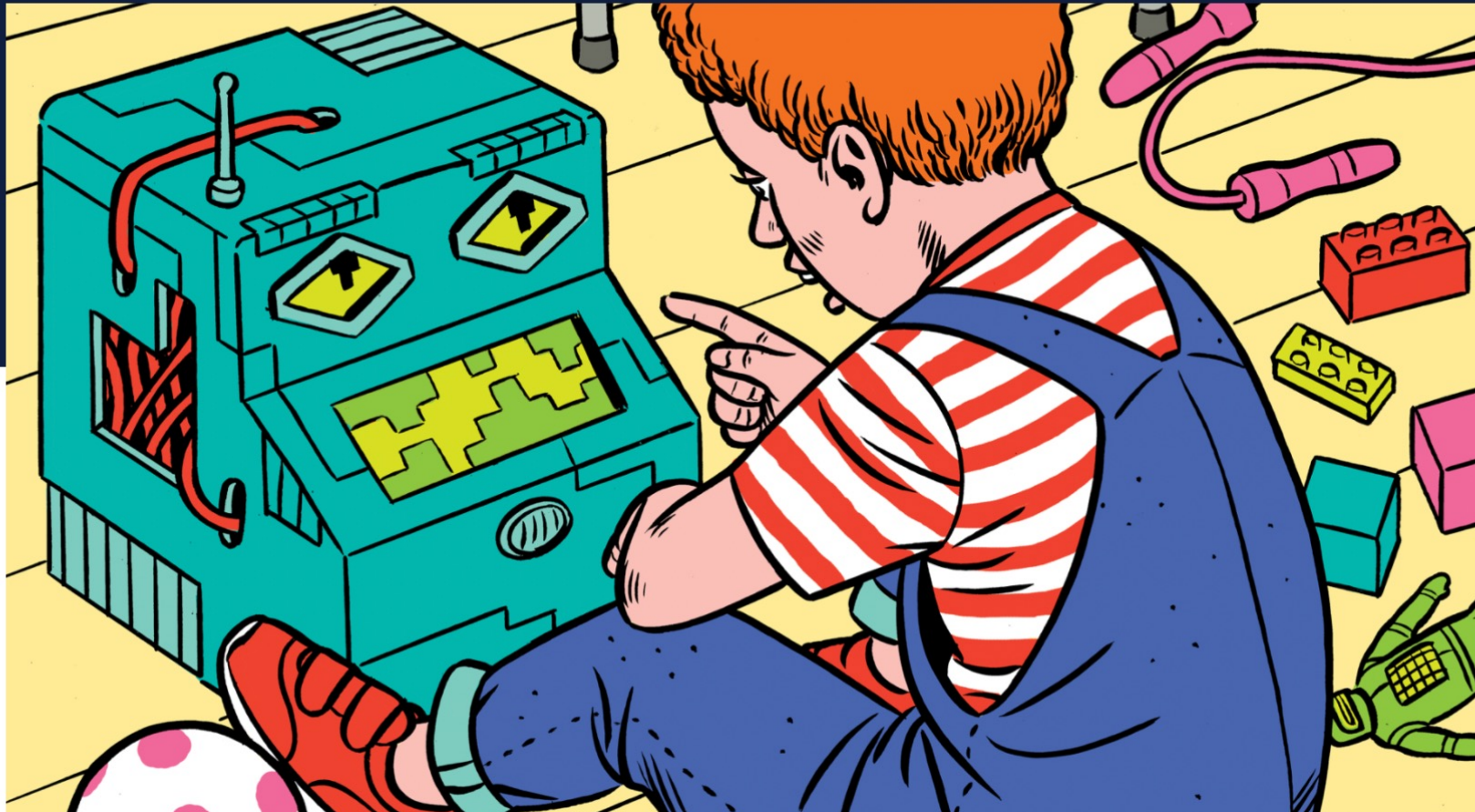


Growing Up with Alexa

What will it do to kids to have digital butlers they can boss around?

By Rachel Metz

August 16, 2017





Watch Video: <https://www.colensobbdo.co.nz/portfolio/work-spark-generation-voice/>

Alexa, Siri... Elsa? Children drive boom in smart speakers

Coronavirus has accelerated the use of voice assistants, but there are concerns about unregulated online 'playgrounds'



Children have been known to share their home address and phone number with voice assistants. Photograph: Amazon

Voice assistants such as Alexa and Siri will become common in children's bedrooms, according to a new report from Internet Matters, the online safety body, which says it is critical for parents to spend more time understanding new technology.

The pandemic has accelerated the adoption of new technology at home by "three or four years", the researchers said, and families in the UK will become much more reliant on voice-enabled devices over the next five years.

Voice assistants don't work for kids: The problem with speech recognition in the classroom

Patricia Scanlon @scanlonpatricia / 7:35 PM GMT+3 • September 9, 2020

Comment



Image Credits: Marko Geber / Getty Images

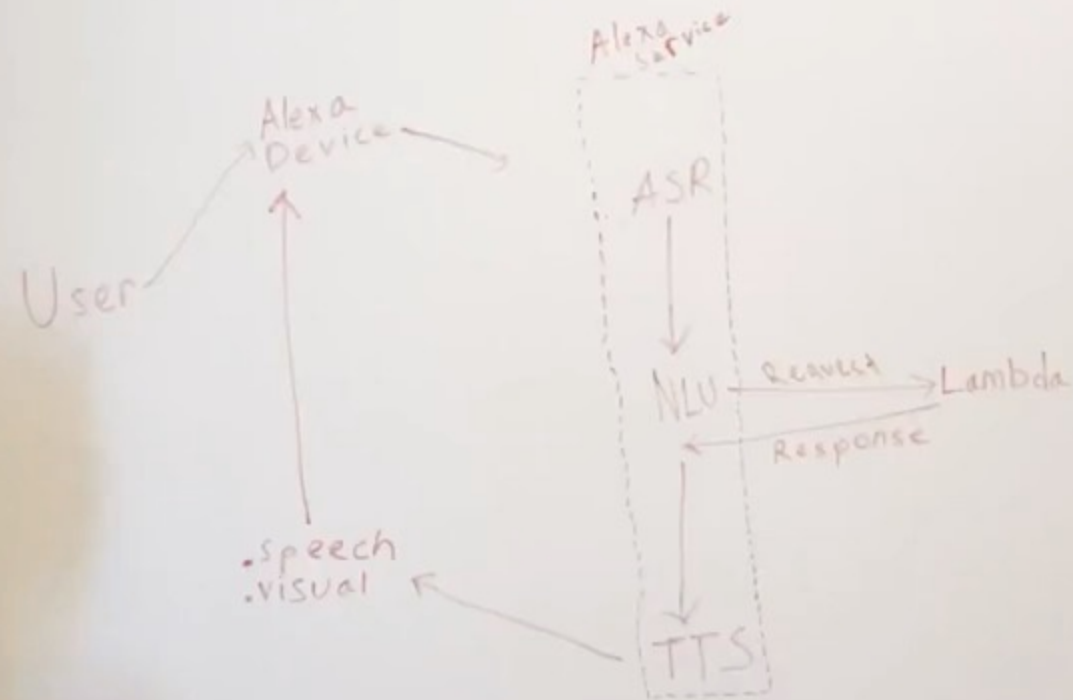
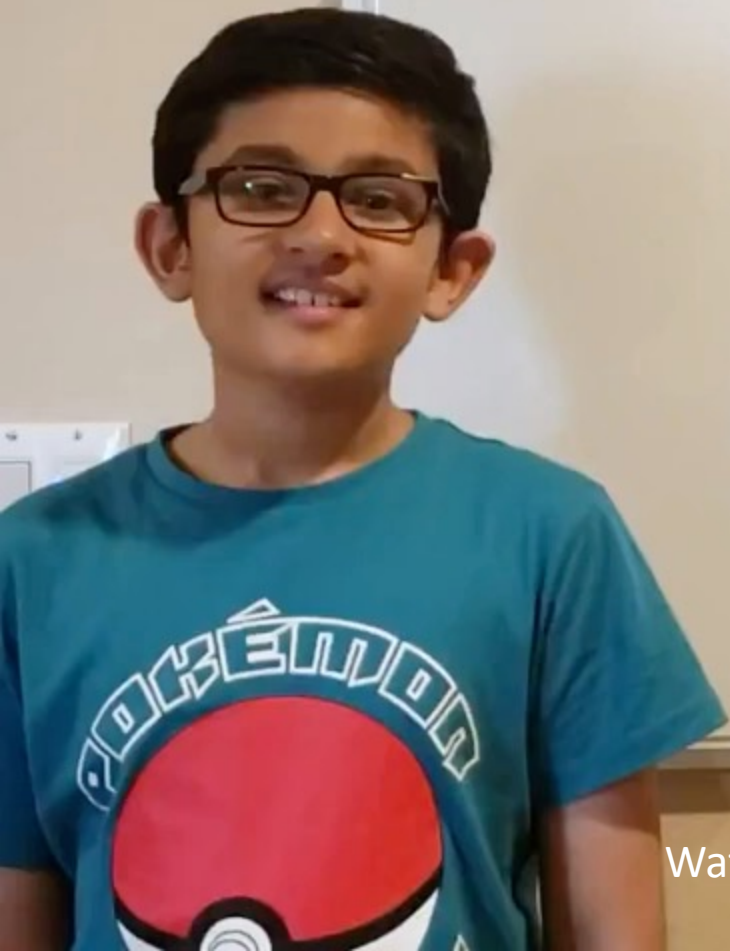
Before the pandemic, more than 40% of new internet users were children. Estimates now suggest that children's screen time has

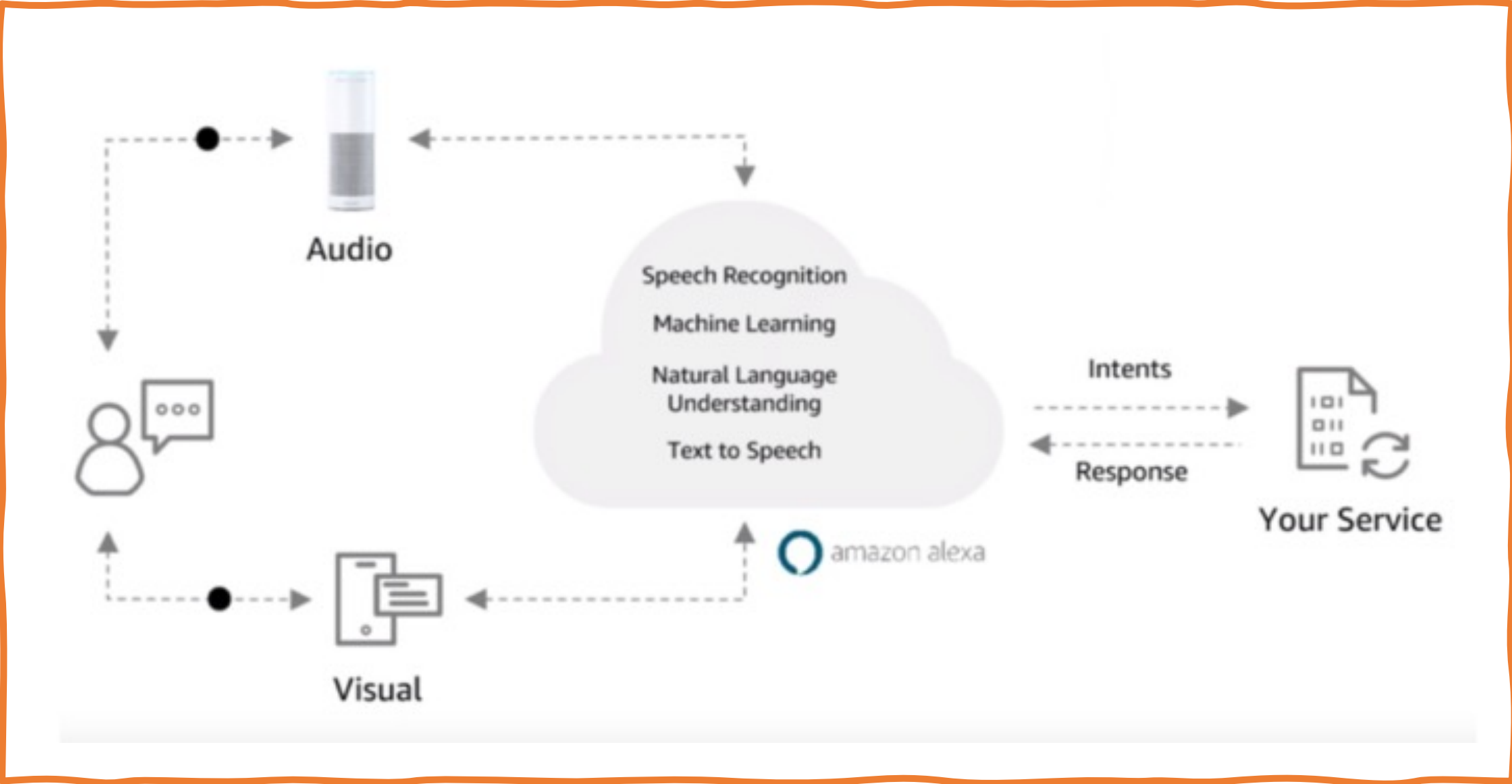
with children 12
of five hours

Dr. Patricia Scanlon
Contributor



Dr. Patricia Scanlon is founder and CEO of [SoapBox Labs](#), a Dublin-





How Alexa works? - Paul Cutsinger



Watch Video: <https://www.youtube.com/watch?v=epyWW2e43UU>

AMAZON · Published June 13, 2019 · Last Update June 14, 2019

Amazon's Alexa voice assistant illegally records children without consent, lawsuits claim



By Christopher Carbone | Fox News

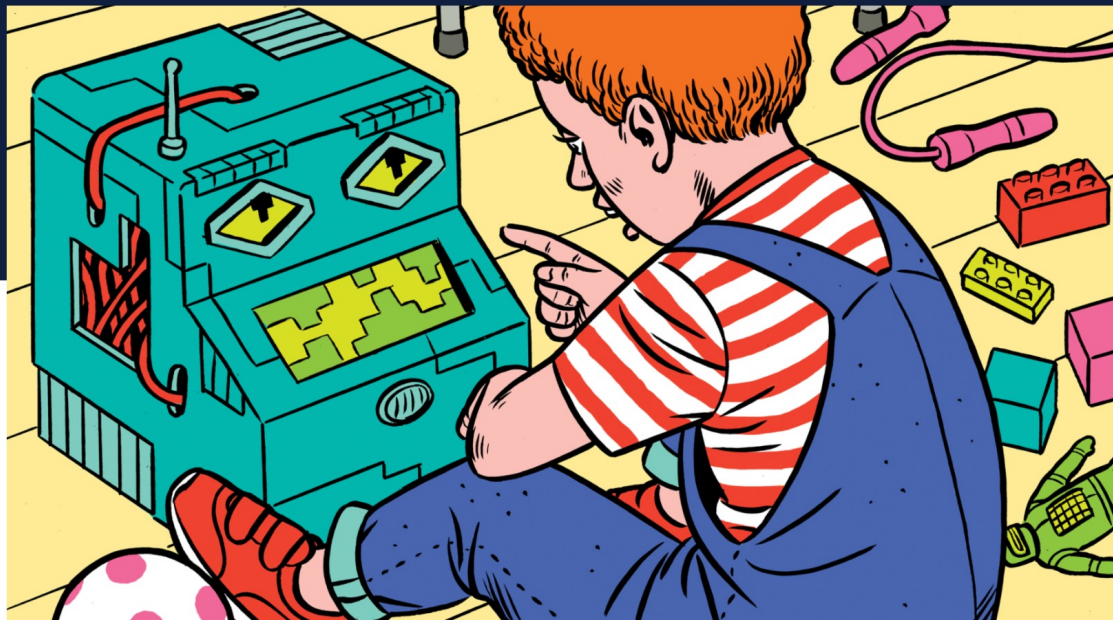


Growing Up with Alexa

What will it do to kids to have digital butlers they can boss around?

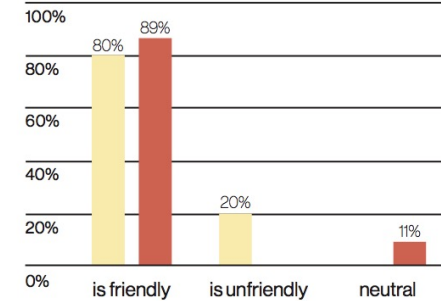
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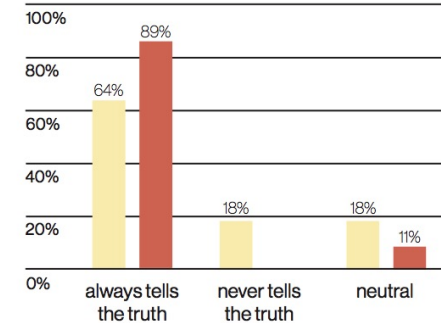
Are digital assistants friendly?

When MIT researchers asked kids how they felt about assistants such as Alexa, they got the following responses.



How often are agents truthful?

Children in the study tended to believe what the assistants said. The younger kids were less sure.



ages 3-4
ages 6-10

Are Digital Assistants Like Alexa Safe For Children?

PARENTING TECH

Shares



Should you say please to Alexa?

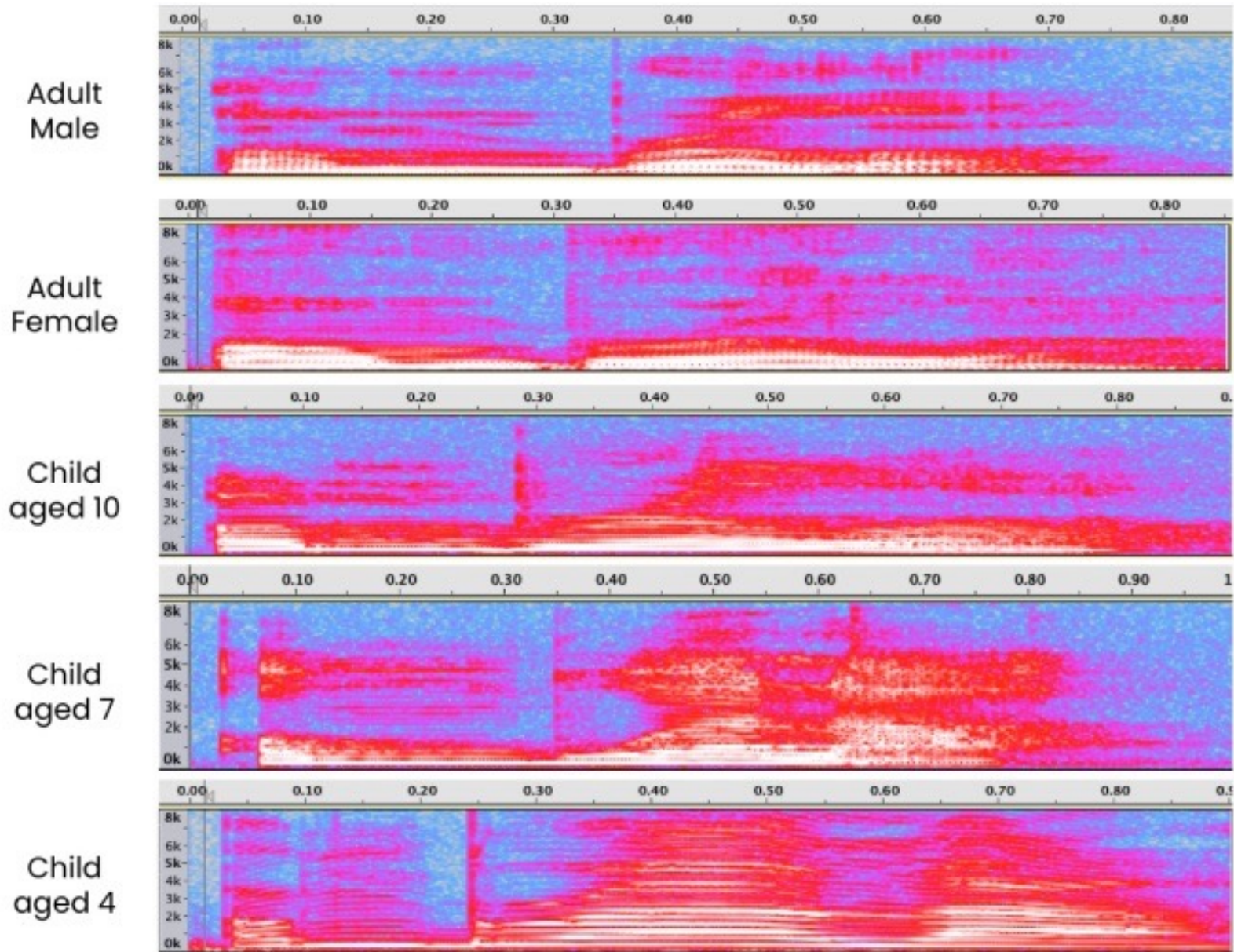
Do you hear Alexa's voice so often it sometimes feels like you have a new family member? You're not alone. Digital assistants, also known as voice assistants, are becoming a part of daily life for many families. They are useful and entertaining,



“Ofcourse parents worry about these devices reinforcing negative behaviors, whether it's being sassy or teasing a virtual assistant. But I think there are bigger questions surrounding things like kids' cognitive development—the way they consume information and build knowledge.”

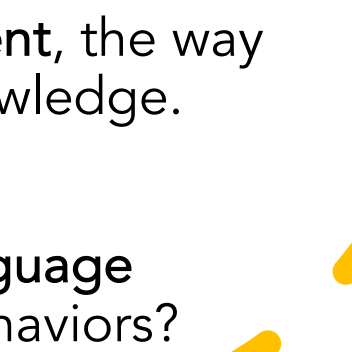
- *Jenny Radesky*, developmental behavioral pediatrician at the University of Michigan.

Watch Video: <https://jelliesapp.com/blog/digital-assistants-alexa-safe-children>



Changing the pitch of adult voices used to train speech recognition fails to reproduce the complexity of information required to comprehend a child's speech. Image: SoapBox Labs

Challenges of designing Voice Assistants for Children?

1. **Privacy implications** – how is their data stored and managed; how do they provide consent for its use?
 2. **Learning new social norms and values** of interacting – how does that conflict with existing norms engaging with others? E.g. trust in AI or internet info., treating AI devices as humans or toys, gendered interactions?
 3. **Engaging** educational, playful and meaningful interactions in the home, school and other places? How does it affect them in these social contexts?
 4. **Influence children's cognitive development**, the way they consume information and build knowledge.
 5. **Handling children's speech patterns, language structures** and erratic / unpredictable behaviors?
- 

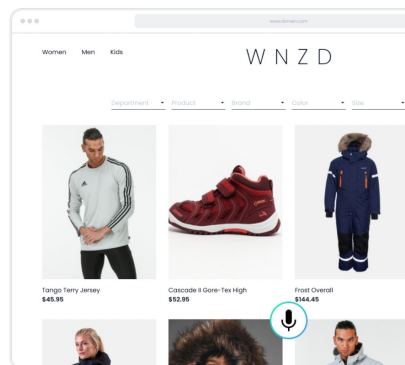
Speechly: simple voice interface API for web and mobile

Experience the difference

The benefits of the ground-breaking Reactive Voice UI design philosophy are rooted in cognitive science and at the core of what we do. Leverage Speechly's real-time, responsive, Spoken Language Understanding® API and ready-made UI components to easily build the fastest and most effective voice experiences.

Our flexible API was built to power an endless number of custom Reactive Voice UI implementations. The only limitation is your imagination.

[Try our demos >](#)



Built for developers

Start building with Speechly

Speechly was designed for fast and simple integration into your existing tech stack.

1

Sign up for an account

Create an Speechly account to get started.

2

Create a Speechly application

Use one of our starter templates or configure your own.

3

Integrate Speechly to your site

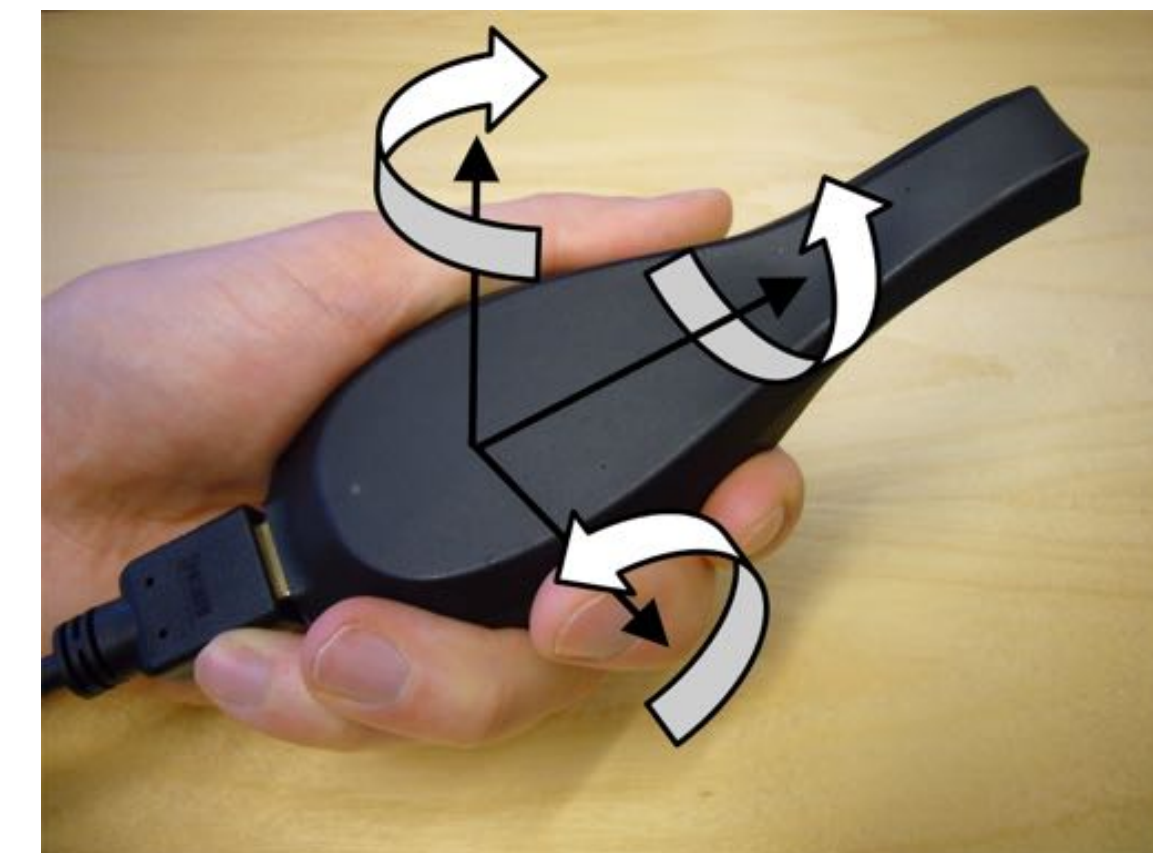
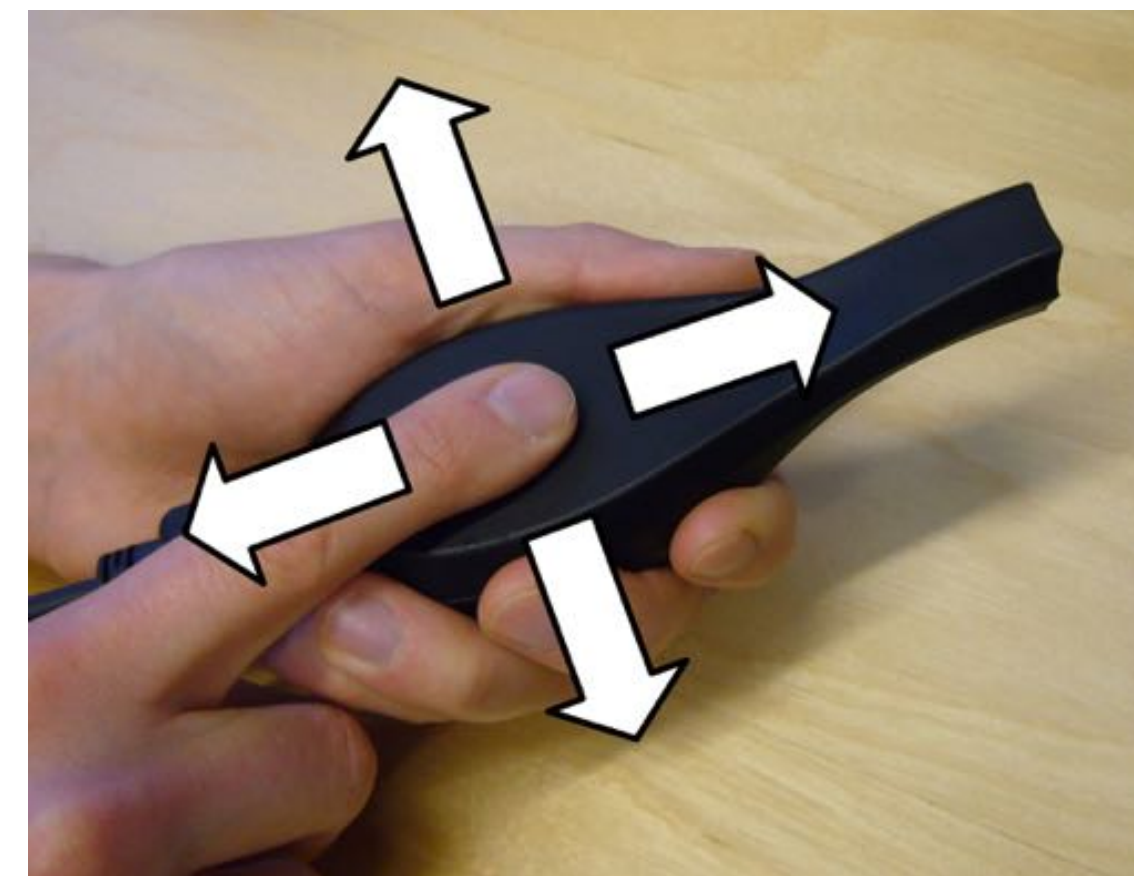
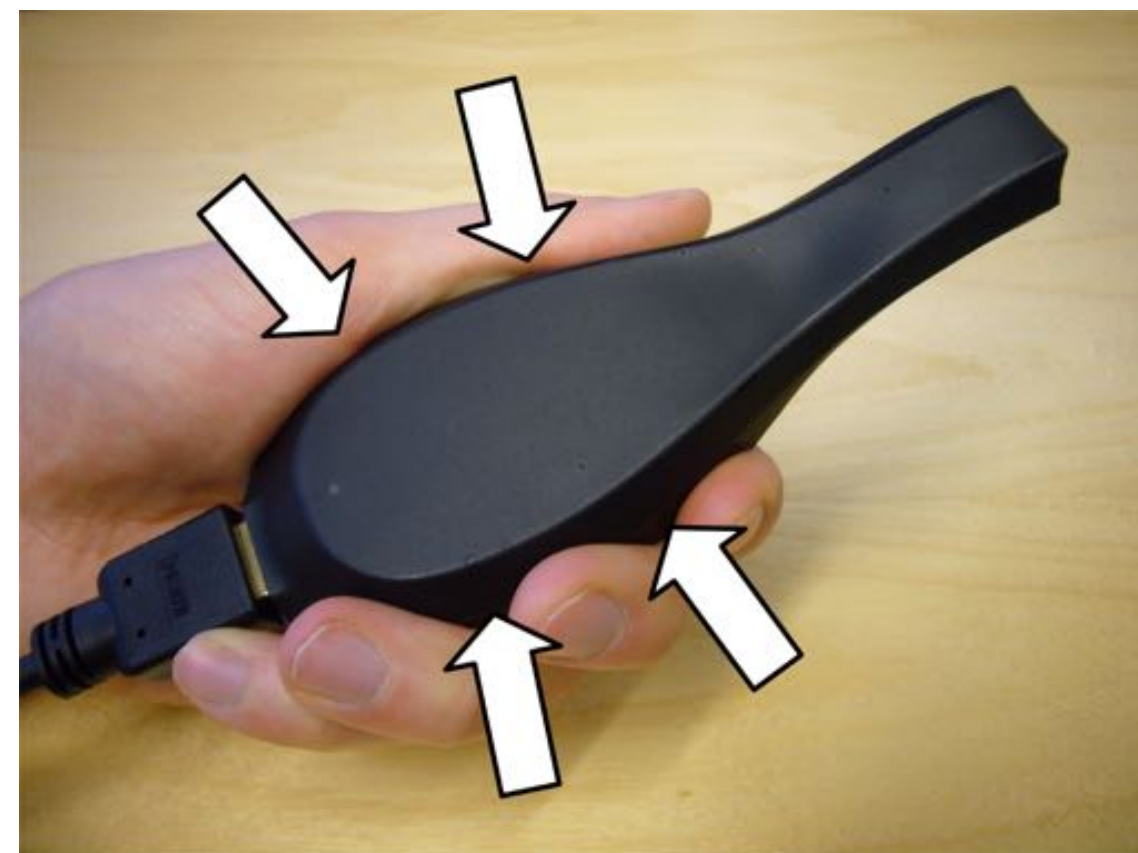
Speechly is available for Web, React, iOS, and Android.

[Start building now >](#)

```
index.html * style.css
16 <script type="text/javascript">
17 document
18 .getElementsByTagName("push-to-talk-button") [0]
19 .addEventListener("speechsegment", (e) => {
20   const segment = e.detail;
21
22   // Handle speech segment and make tentative changes to app
23   console.log("speechsegment message:", segment);
24
25   if (segment.isFinal) {
26     // Handle speech segment and make permanent changes to app
27     // Optionally show confirmation
28     window.postMessage({ type: "speechhandled", success: true
29   }
30 });
31 </script>
```

Try Speechly demos: <https://www.speechly.com>

Vocal Sketching: a Prototype Tool for Designing



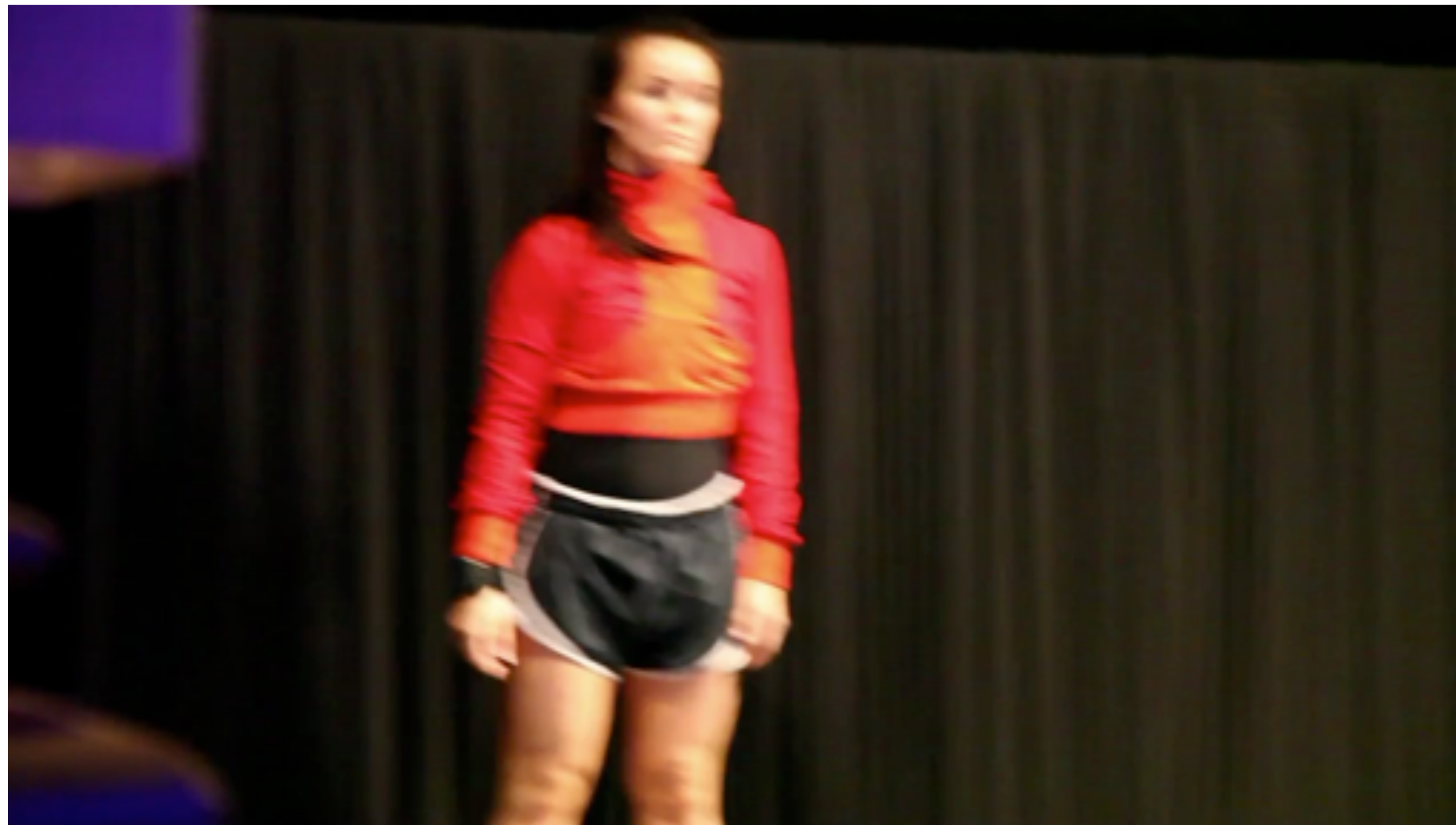
Koray Tahiroğlu
Department of Art and Media, Aalto University, School of ARTS

Vocal Sketching: a Prototype Tool for Designing



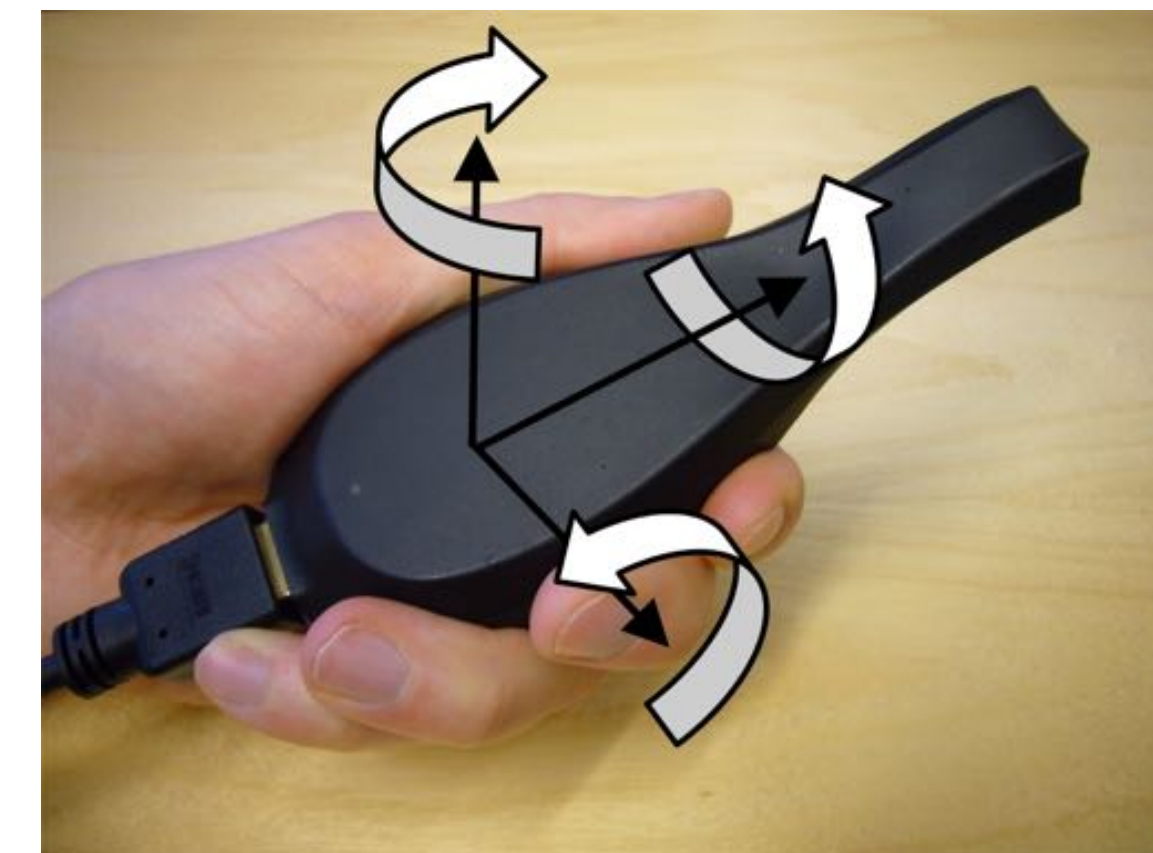
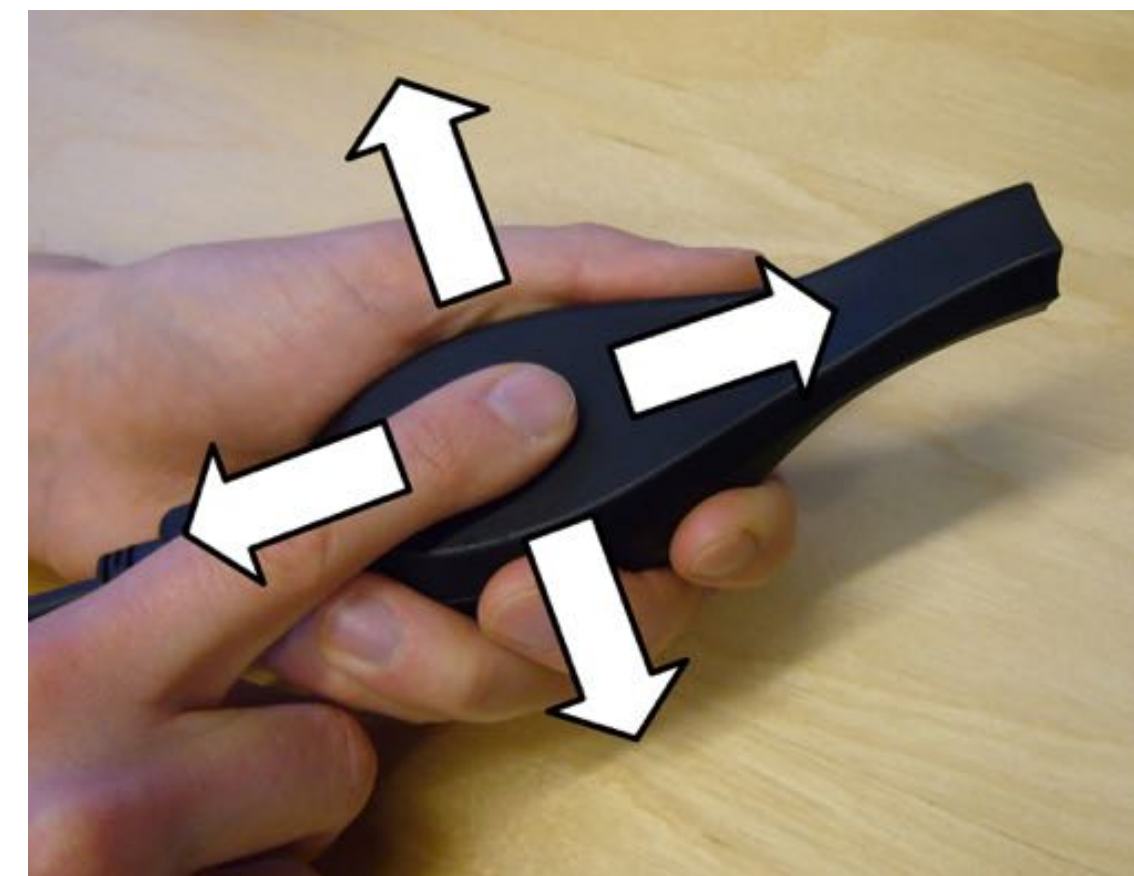
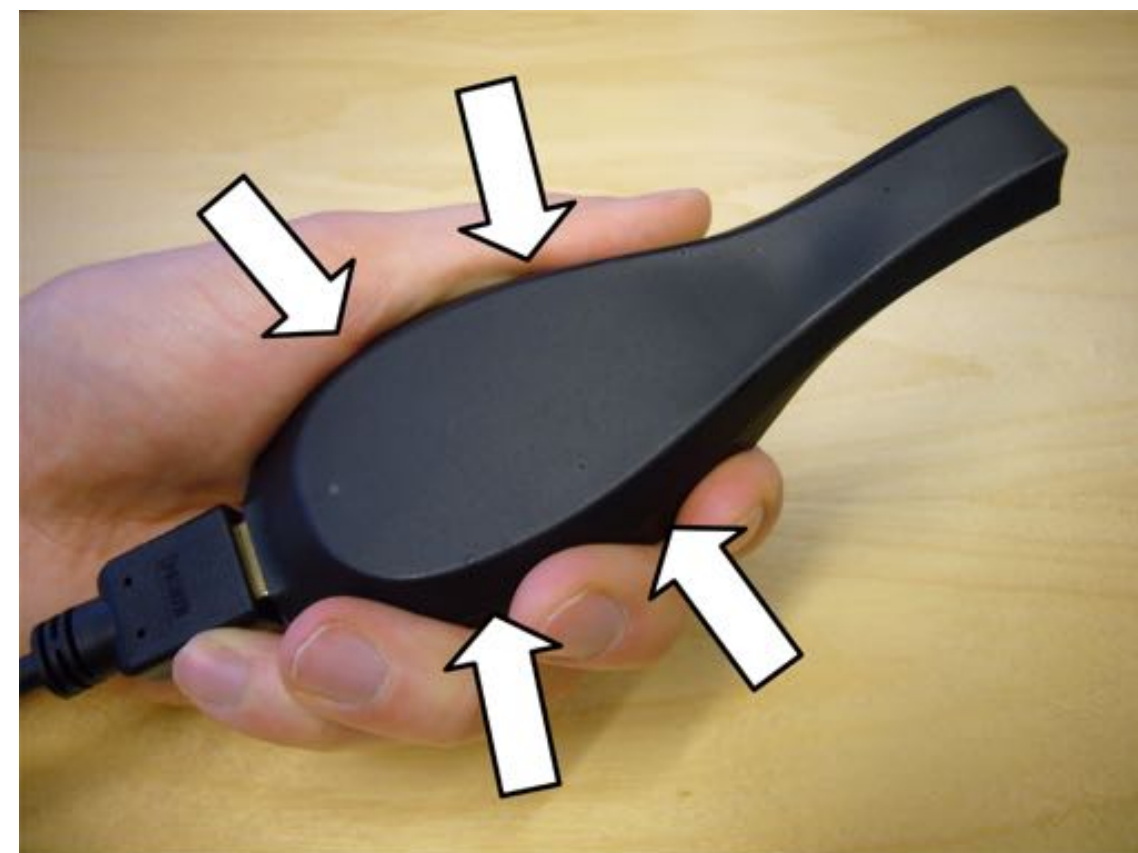
Ariane Sensor Box, NOKIA

Vocal Sketching: a Prototype Tool for Designing



<https://vimeo.com/60741536>

Vocal Sketching: a Prototype Tool for Designing



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<https://vimeo.com/667655724>

Vocal Sketching: a Prototype Tool for Designing

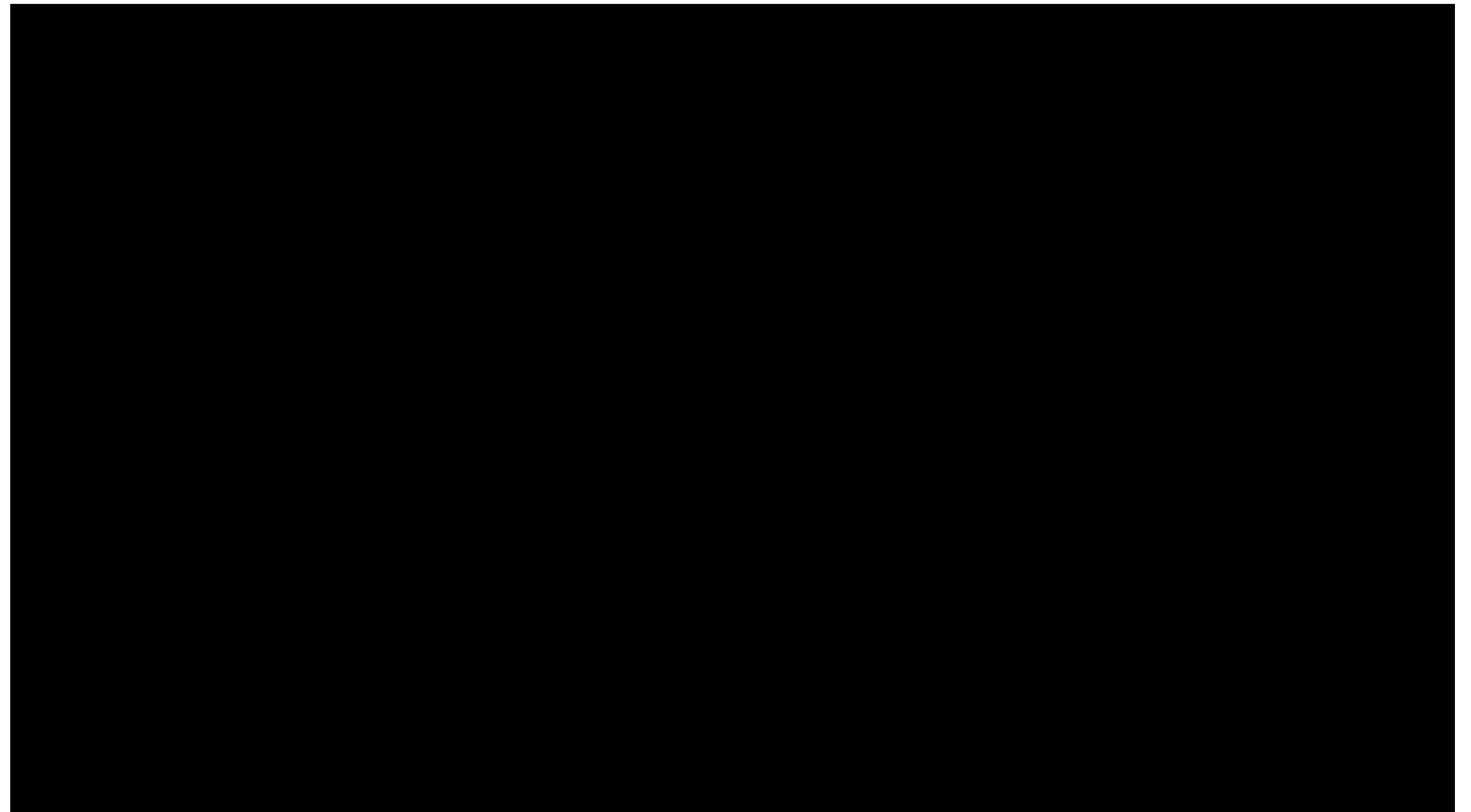


<https://vimeo.com/63524617>

Designing Voice and Auditory Interaction

**Vocal Sketching: a
Prototype Tool for
Designing**

**DDSP tone-transfer
application as a
sound design tool by
Taeho Kim**



<https://vimeo.com/554165582>
