Designing Voice Interfaces: Back to the (Curriculum) Basics

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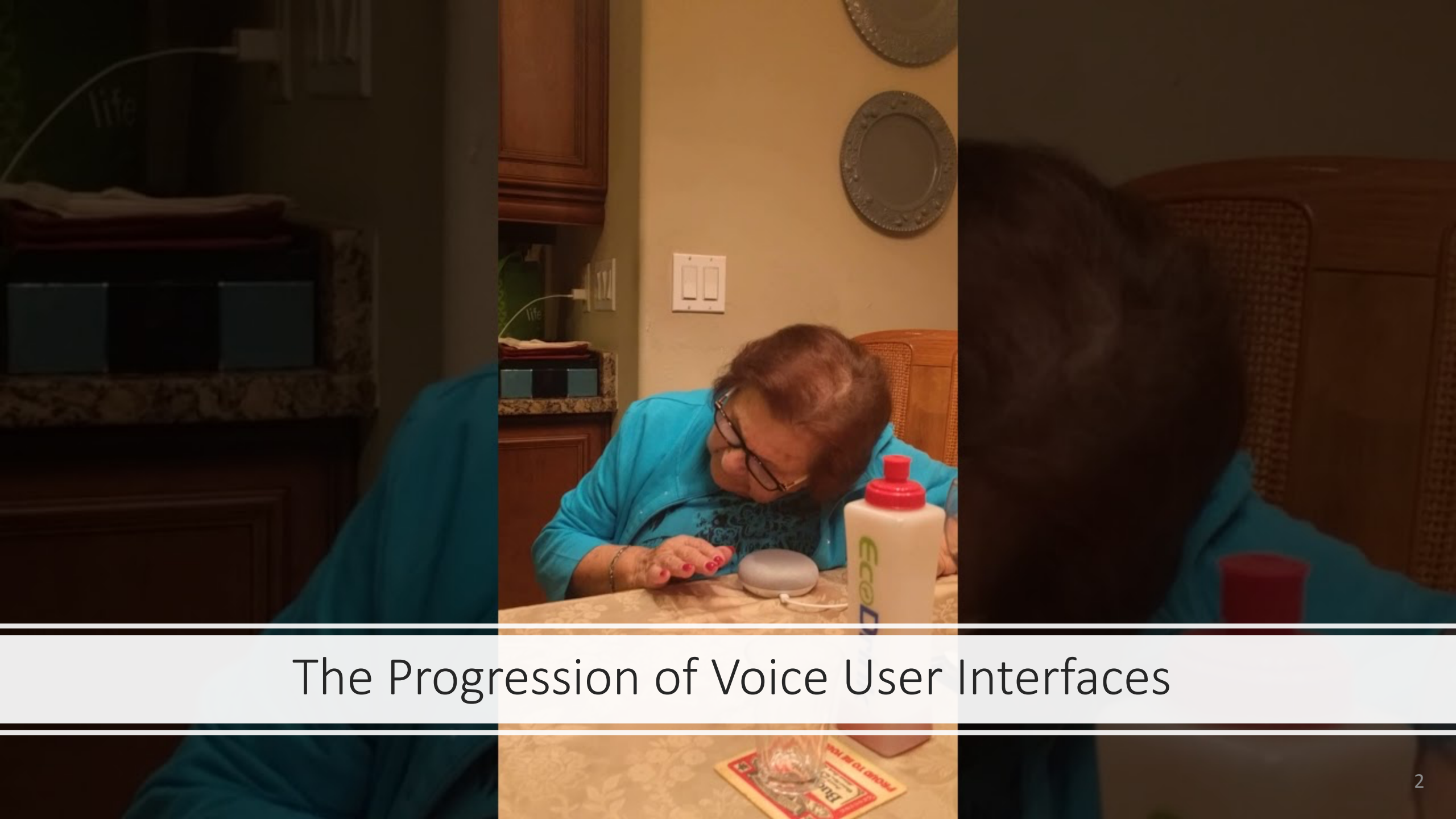
Tech companies want your smart speaker to take on health care

Amazon hopes Alexa will detect when you're having a heart attack.

A baby in the UK reportedly said 'Alexa' as his first word, and it reveals a raging debate over how children use tech

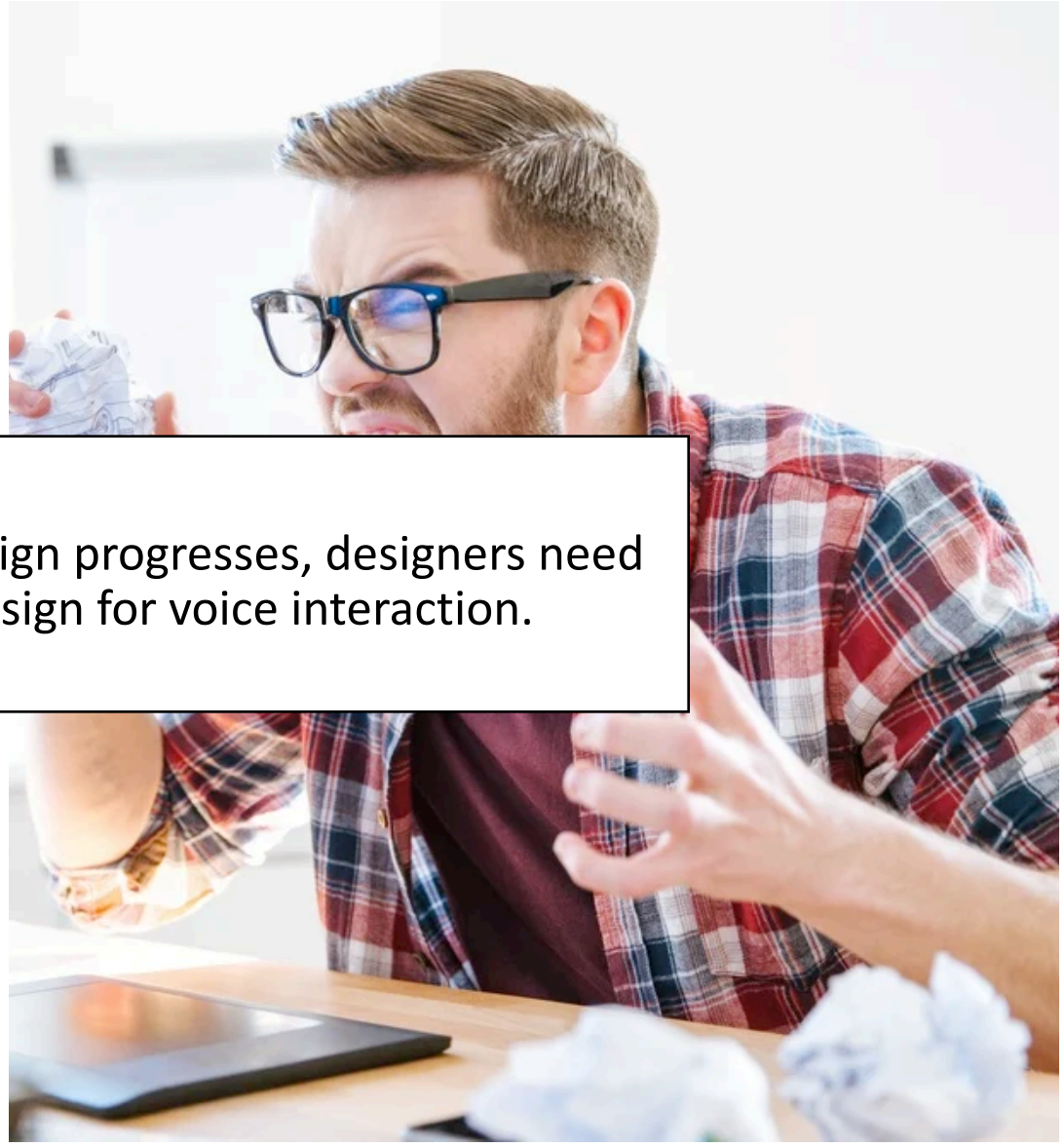
LOO-NACY You can now talk to your LOO with world's first Amazon Alexa toilet – meet the Kohler Numi 2.0 from CES 2019

Google's Duplex: AI that makes you think you're talking to a human



The Progression of Voice User Interfaces

As Voice User Interface (VUI) design progresses, designers need to be properly trained to design for voice interaction.



We've been teaching about how to build good Graphical User Interfaces (GUIs) for awhile now.

- CSC318: Design of Interactive Computational Media
- CSC428: Introduction to Human-Computer Interaction
- CCT380: Human Computer Interaction and Communication
- CCT480: User Experience Analysis
- CCT485: User Experience Design
- INF3101: Special Topics in Information: Interaction Design
- INF1602: Fundamentals of User Experience

How is VUI Design being taught in HCI Education?

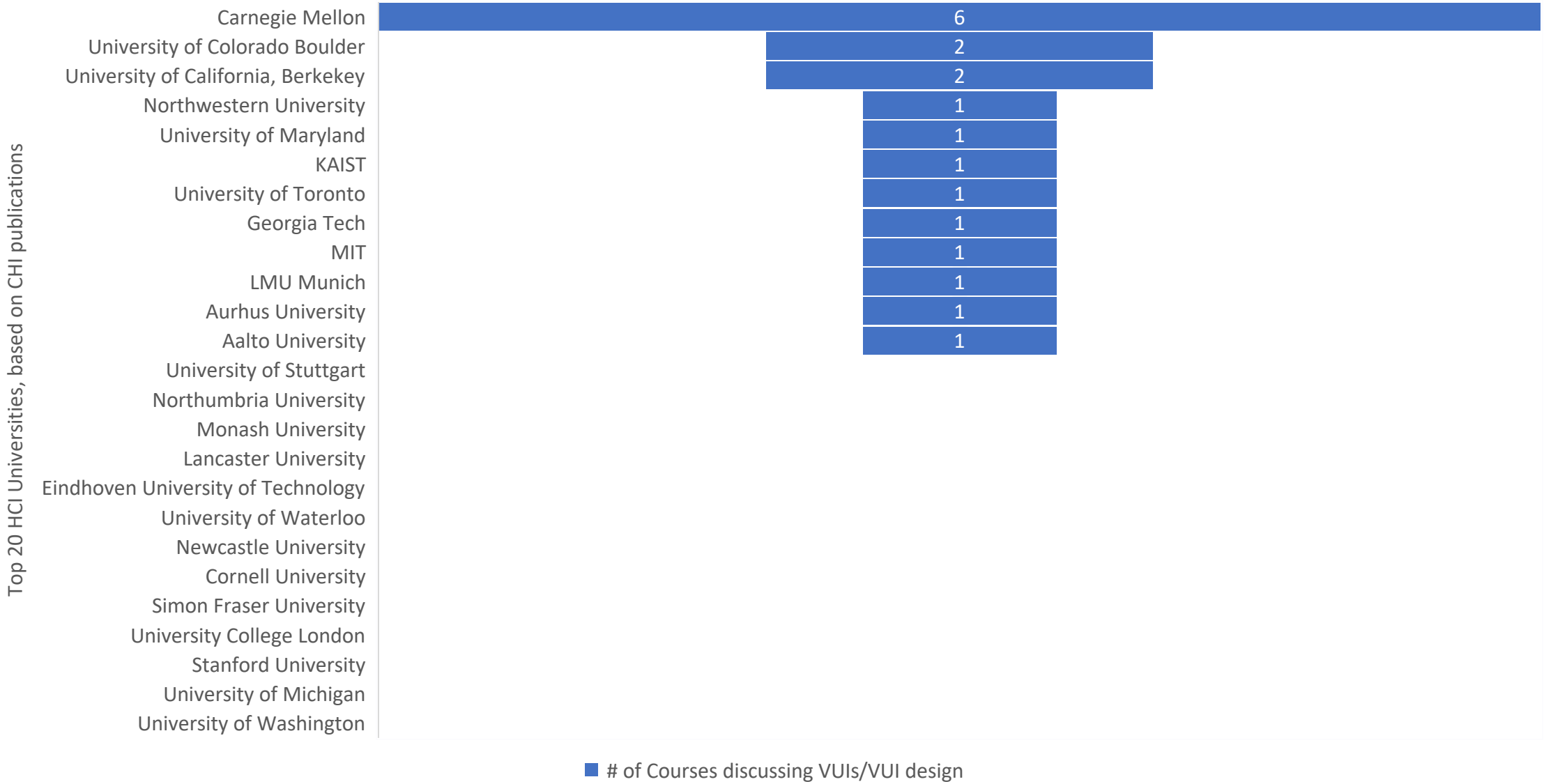
Conducted a scoping scan of 25 international universities, and identified potential VUI courses

Performed a more in-depth syllabi and course material meta-review on a selection of VUI courses

A Bird's Eye View on VUI Design in HCI

VUI Course Keywords
conversational interface; conversational agent; conversation; voice; voice agent; voice user interface; dialogue agent; audio; auditory; speech; speech interface; human-robot interaction; smart home; personal smart agent; personal smart assistant; interactive robot

Courses that Discuss VUIs in HCI Departments



Main Course Topics

Artificial Intelligence/Intelligent Interfaces

Emergent/future interfaces

Human-robot interaction

Multi-modal interfaces

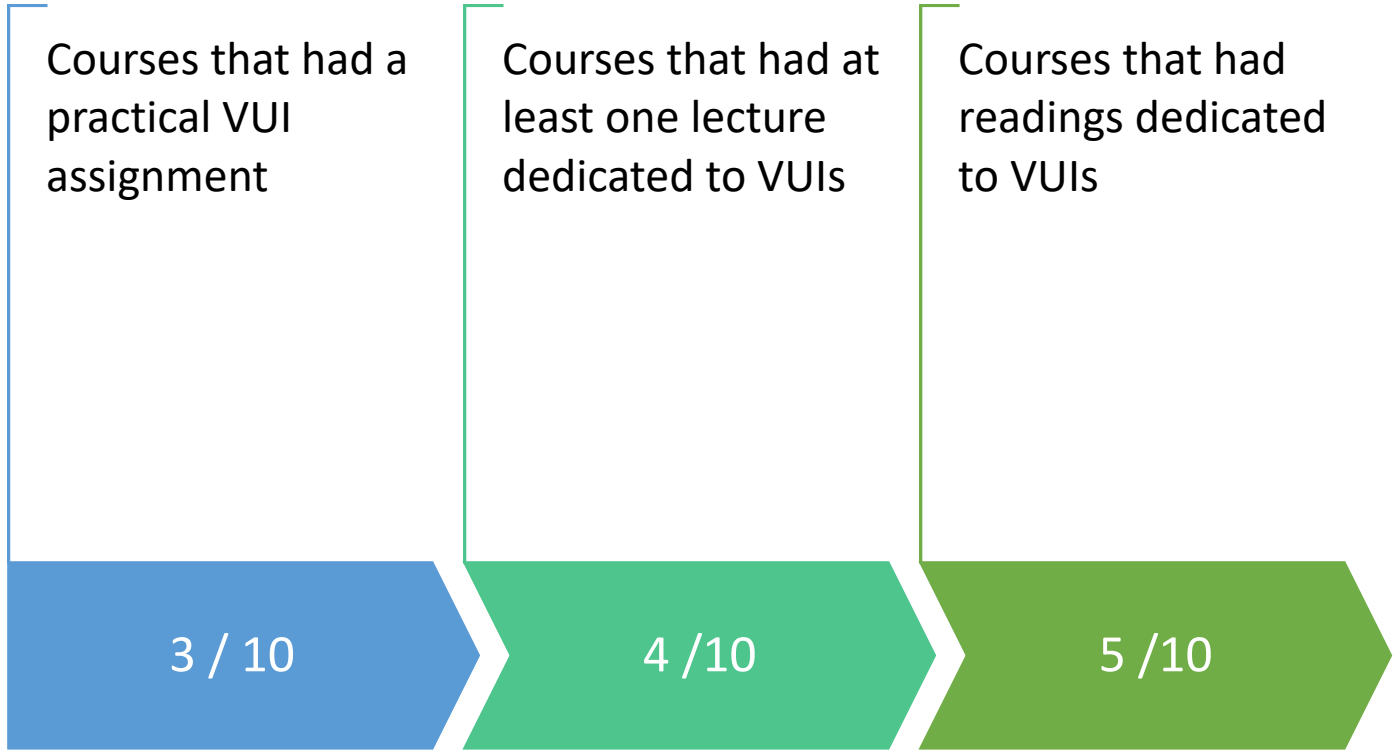
Speech Interfaces

Delving Deeper: Exploring HCI Syllabi and Course Materials

- Performed a syllabi and course material review of 10 identified courses
- Identified four themes:
  - Course Materials Related to VUIs/CUIs
  - Breadth and Depth of VUI/CUI Coverage
  - Framing of VUI/CUI Discussion
  - Extent of VUI/CUI Covered *Specific to Design*

Course Name	University Name
C1. Advanced User Interface Software	Carnegie Mellon
C2. Conversational Interfaces	Northwestern University
C3. Emergent User Interfaces	Aalto University
C4. Human-Computer Interaction	KAIST
C5. Human-Robot Interaction	Georgia Tech
C6. Intelligent Multi-Modal Interfaces	MIT
C7. Intelligent User Interfaces	LMU Munich
C8. Special Topics in HCI: Human AI Interaction	Carnegie Mellon
C9. Special Topics: Ubiquitous Personal Smart Agents	Carnegie Mellon
C10: The Interactive Society	University of Toronto

Course Materials Related to VUIs



Breadth and Depth of VUI Coverage

The average percentage of VUI lecture coverage was 12% across all 10 courses

The largest percentage of lecture coverage in the 10 courses was 35% (in one course)

Only 1 assignment per course at most was dedicated to VUIs (among those that contained VUI assignments)

Framing of VUI Discussion

VUIs were often framed in the context of Artificial Intelligence or “Intelligent Agents”

Larger focus on Natural Language Computation or Dialogue Systems

Extent of VUI Coverage Specific to Design

Only four courses discussed VUI or CUI ***design*** (particularly *interaction design*)

One focused on dialogue design for text chatbots

Only two courses taught about the design of a ***voice*** user interface

Findings

- Lack of both *theoretical* and *practical* considerations for designing VUIs and CUIs
- Lack of discussion on *voice-based* interfaces
- Little focus on *interaction design*

Moving Forward

- We call the HCI community to take the step forward to more largely incorporate VUI design training into HCI curriculums
- We need to develop *pedagogical tools* that educators can use to teach about VUIs (guidelines, design methods, etc)

Future Work

- Further work to come – we need the community's help to develop a VUI design curricula
- Interviews, participatory design sessions, etc.
- You may hear from us…