University of the Peloponnese
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Reevaluation of standards and procedures of human-computer interaction in XR

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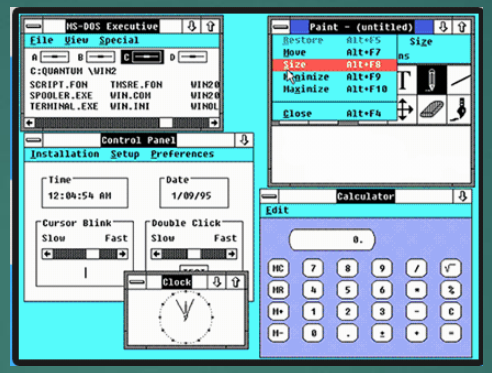
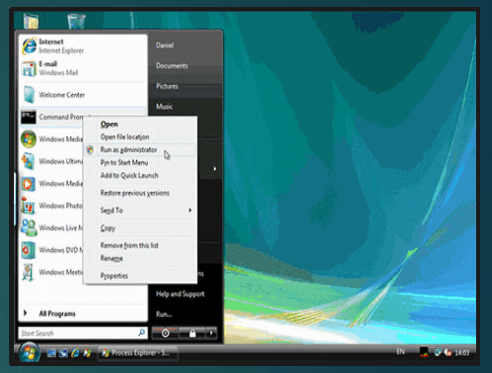
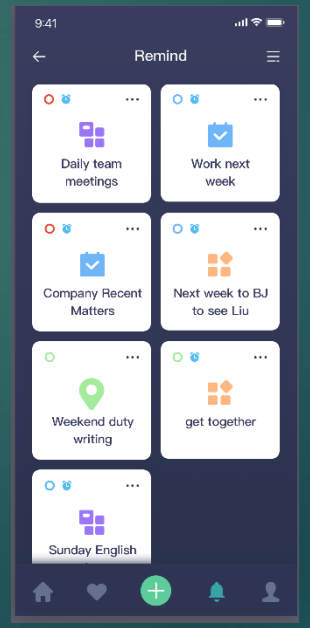
Human Computer Interaction







HCI – The keyboard case

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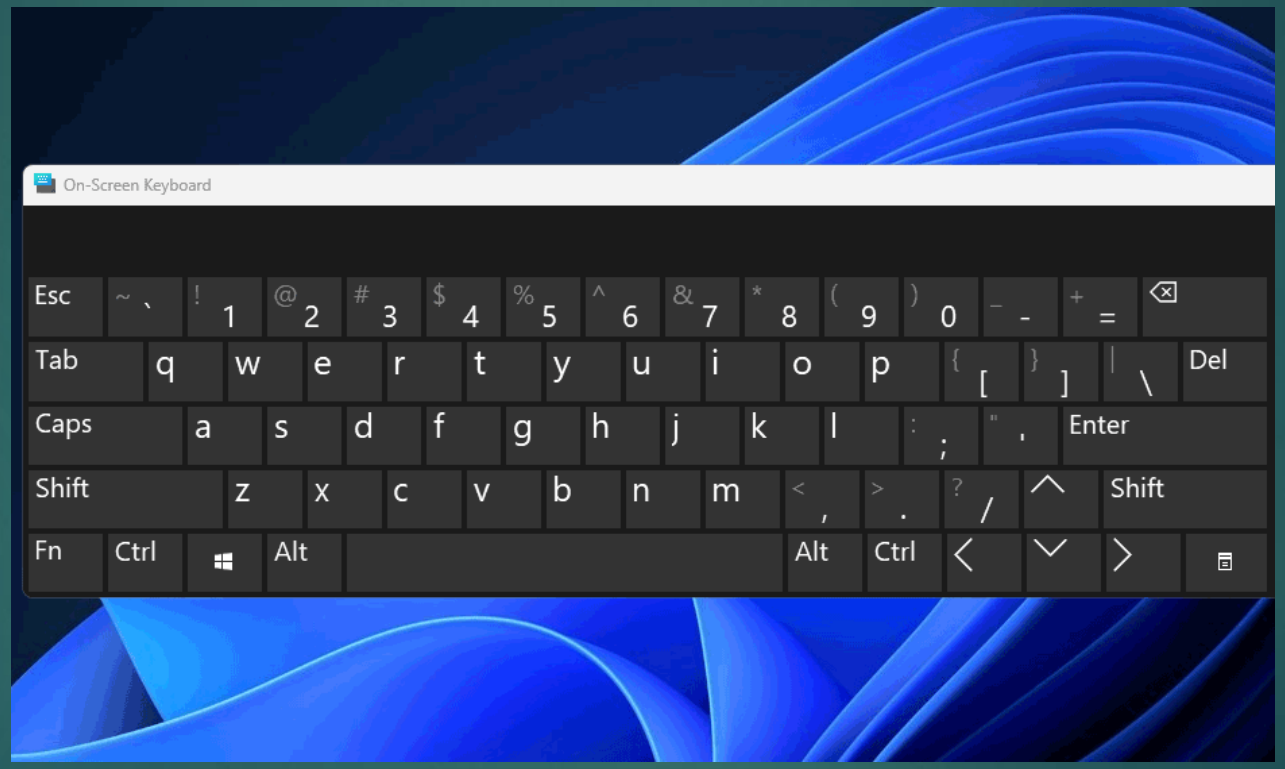

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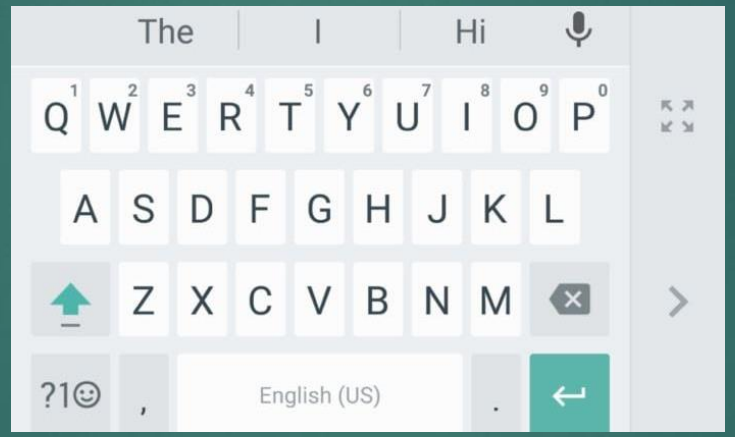

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Main Objective

- Delve Deeper in the usability (and satisfaction) aspects of input methods in both XR and standard environments.
- Provide a comprehensive framework of the evaluation & comparison process.
  - Both in terms of software libraries and general guidelines.
- Outline common pitfalls and difficulties that are common to arise in the future, in similar attempts.

First Step

- Problem: What is the current "problem space"?
  - What are some common HCI methods?
  - What is their impact in the current systems?
  - Are they good candidates for XR systems?
- Solution: Cataloguing & Taxonomy
  - Mode of Interaction
  - Bowman HCI Taxonomy / Purpose taxonomy
  - Continuity (discreet / continuous/ freedom axes)

Input category	Input method	explanation
Discreet input – hands	"Qwerty" traditional keyboard	Alphanumeric input augmented with special functions
Discreet input – hands	Chord keyboard	Single hand press of multiple buttons translates to different characters
Continuous input – hands	SpaceBall	Linear motion and rotation in 3 integral dimensions (6 degrees of freedom) with a physical control object
Continuous input – hands	Electromagnetic/sonic tracker	Linear motion and rotation in 3 integral dimensions (6 degrees of freedom)
Continuous input – hands	Glove input devices	Measure the position of the user's fingers and translate it to gestures
Continuous input - full body	3d trackers	Measure the position & rotation of the user's different body parts and translate them to gestures.
Continuous input – Voice	Speech to text	The user's continuous speech patterns are translated to the equivalent alphanumeric input
Continuous input – Voice	Natural language recognition	Using AI models, recognize the user's inputs as demands and answer accordingly
And more...		

Next Steps

Bibliographic Study

Scope limitation

Within-subjects User Studies

Identify subject groups

Experiment scenarios

Check for demographic biases

Data Analysis

Qualitive data analysis (user experience)

Quantitive data analysis (user performance)

Prototyping

Analytics Logging library

Baseline HCI application

Novel HCI application

Thank You !