

PIANO 2.0

My HCI research project



Jordan Aiko Deja
Why we teach and do research in HCI?



Živjo! 🖐️

My name is **Jordan**. I'm a PhD student at the HICUP Lab in Slovenia. I'm also affiliated with **DLSU COMET** and **UXPH**.



Outline

- Why my research project is considered an HCI project
- The research problem that I am trying to solve
- Inspirations to my intended solution
- A (non-exhaustive) set of activities that I do
- My intended contribution
- Moving forward with my HCI research

What am I doing?

No, this is not an existential question

Not just building a piano

We're solving a problem that is relevant to users (of technology)

People users of the piano

Technology the piano (and its latest features)

Task learning, performing and
improvising in the piano

The modern piano has several features and augmentations.

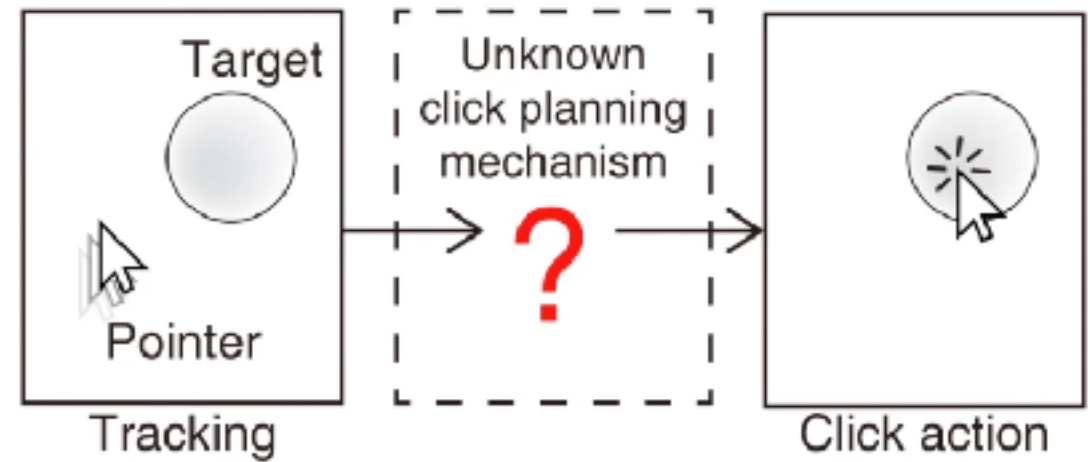
However, people still struggle with using them.

We need a design that fits their use-case and see if these features don't add problems.

the research problem

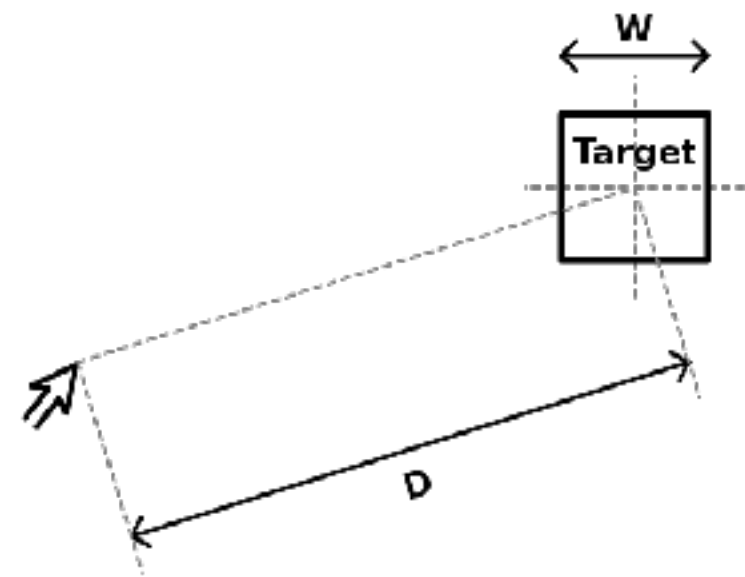
ICP model temporal pointing

The Intermittent Click Planning (ICP) model understands how humans plan their action before clicking a moving target.

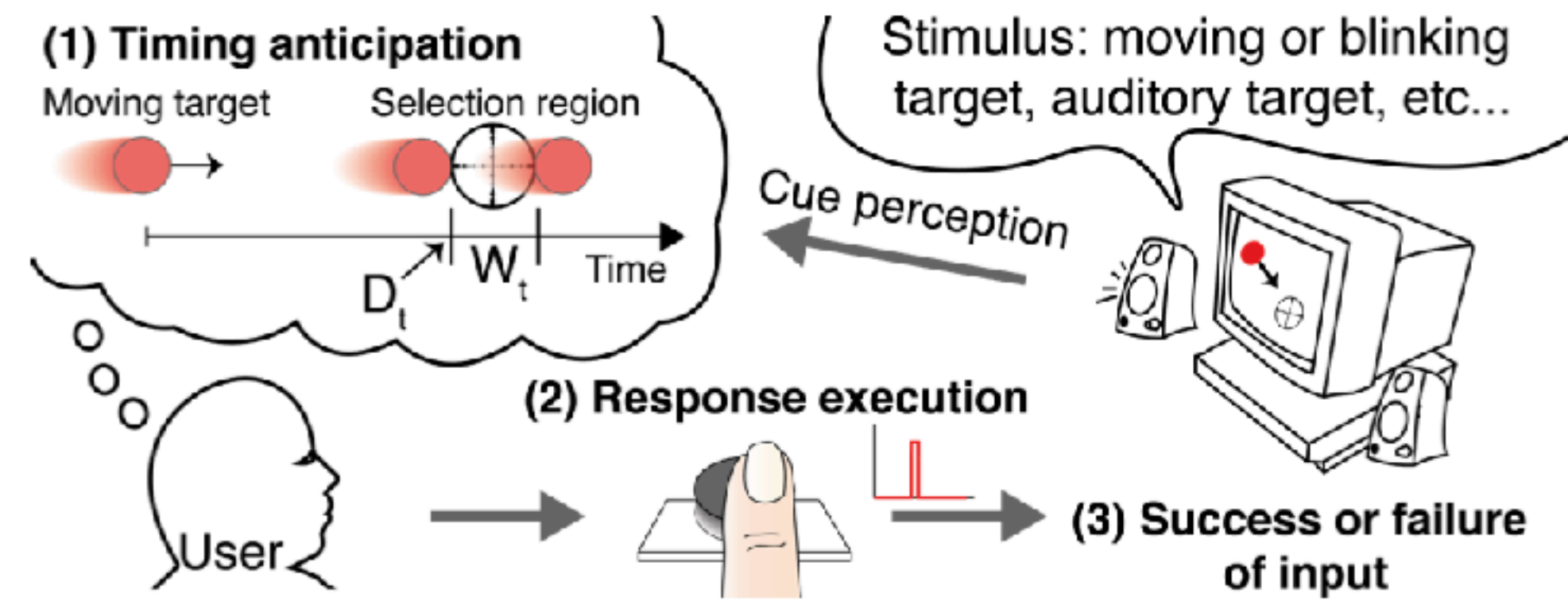


Fitts' Law

predicts the time required to rapidly move to a target given the ratio between the distance (D) to the target and the width (W) of the target



This is referred to as Fitts' Index of Difficulty (ID).



An interactive task defined by three (3) conditions namely: **discrete input** (e.g. button press), **no spatial demand** (the finger is on the button - it is not moving), **time window defining success and failure** (you either miss or hit the shot)

spatio-

A temporal task becomes a **spatio**temporal task if we add the spatial (space component). **AR/VR** are ideal spatiotemporal environments.



spatiotemporal moving target selection

refers to acquiring the target in spatial (**space**) & temporal (**time**) domains simultaneously.



Using STMTS we can **model** and predict user errors when pointing at targets. We can introduce **interventions** to help **mitigate errors** using these models. This has been observed in single-target pointing scenarios. **Multiple target** moving target pointing have yet to be explored. Using the piano with **piano roll visualizations** is an example of such scenarios.

the inspirations to the solution

What I've been doing

and what I intend to do...

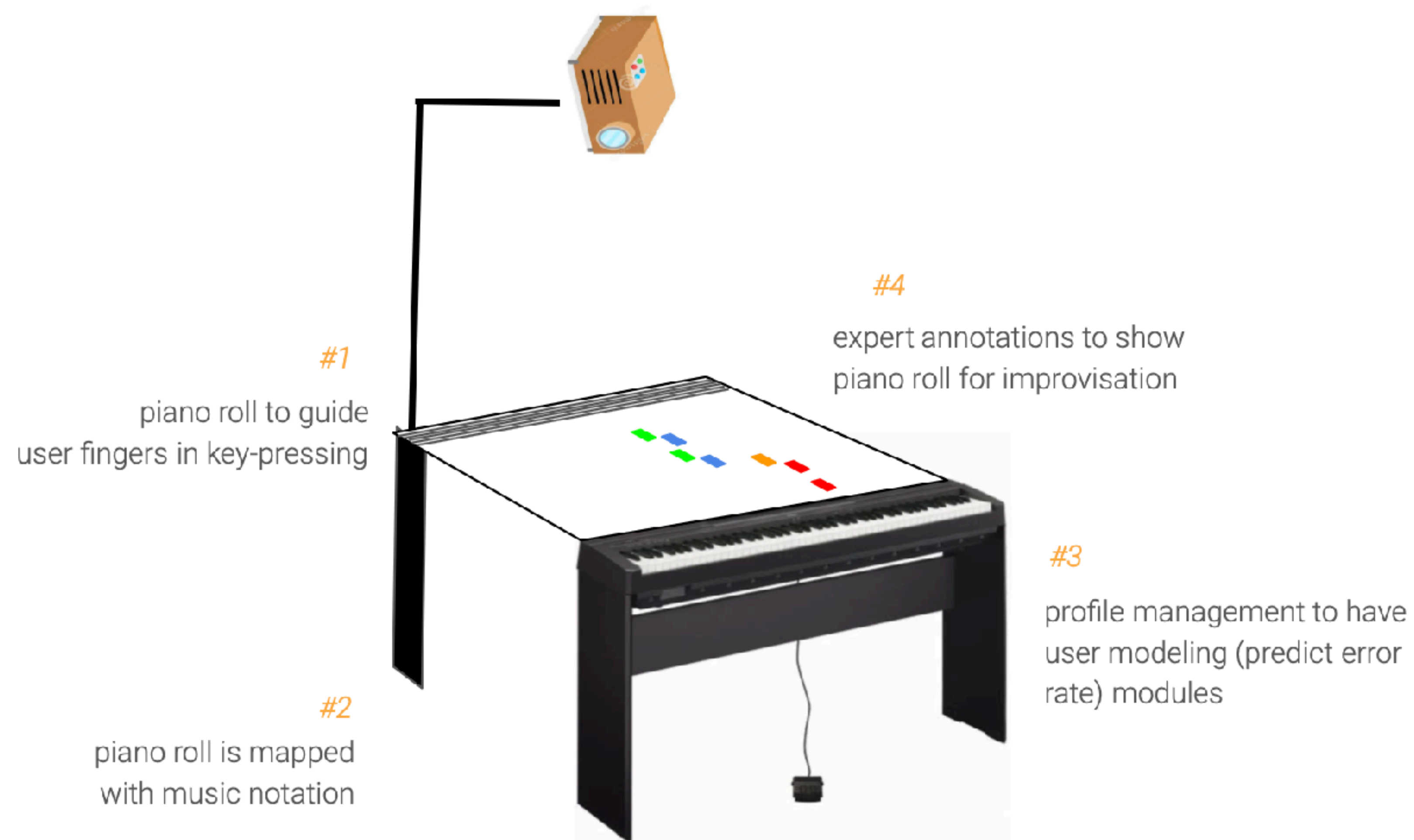
surveys & reviews
user interviews
thematic analysis
some grounded theory & axial coding

the needed legwork to establish my research problem

[illegible]

some "engineering"

A digital piano with a transparent screen displaying a music interface. The screen shows a musical score with notes and a piano roll. The piano keys are visible through the screen. The piano is on a wooden table. In the background, there are electrical outlets and a white board. The text "and some calibrating" is overlaid at the bottom right.



build models of STP data
design & implement the piano improv roll
run user tests, analyse findings, test
statistically (iterate!)
write & publish results (along the way)

things I still need to do (~~so I can finally graduate~~)

my intended contributions...

(based on Wobbrock and Klentz's 7 types of HCI contributions)

- **Surveys:** a survey of the existing landscape of piano augmentations and a list of recommendations to better design them (**done!**)
- **Artifacts:** an augmented piano prototype with improv piano roll (**ongoing**)
- **Theoretical:** a pointing model for spatiotemporal data on piano improvisation (**ongoing**)
- **Empirical:** an understanding on how pianists learn and improvise with adaptive visualizations (**soon!**)

Moving forward with my HCI research

aka “things I’ll do when I graduate...”

- focus on **computational interactions** as an expertise
- contribute to **creative & reflective technologies**, **user proficiency & skills improvement**, as my thematic areas (performances, composition)
- use **augmented/mixed reality**, **machine learning**, **drones & mobile techniques** as my suite of tools

I personally believe that the future is in gestures and movement!



<https://jrdndj.github.io>

for more details and updates on my research

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