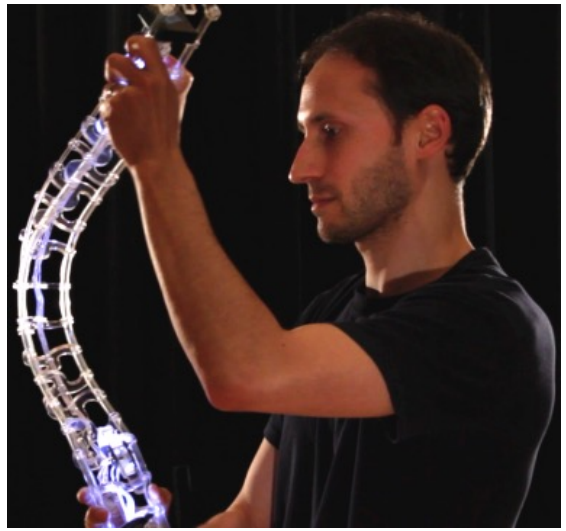
RÉPUBLIQUE FRANÇAISE
*Liberté Égalité Fraternité*

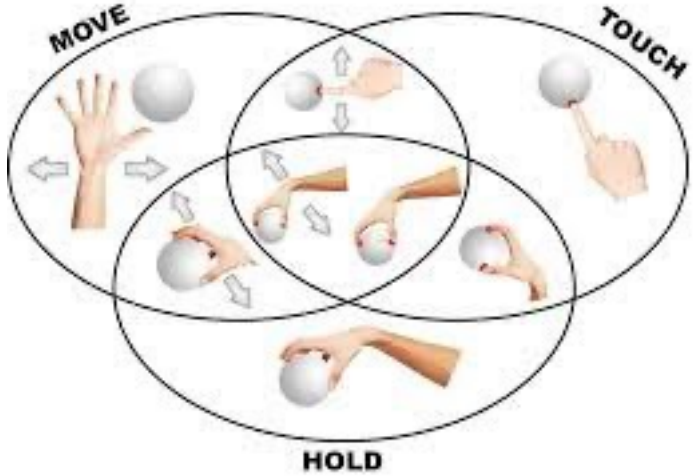
ENAC

ETIS 2022

# Dronible: operating drones with tangible objects

*Jérémie Garcia, Nicolas Viot, Dong Bach Vo, Sylvain Pauchet*





# Goals of the workshop

1. Spread Human-Drone Interaction
2. Practice physical and digital prototyping techniques for HDI
3. **Have fun** in a creative and cooperative activity

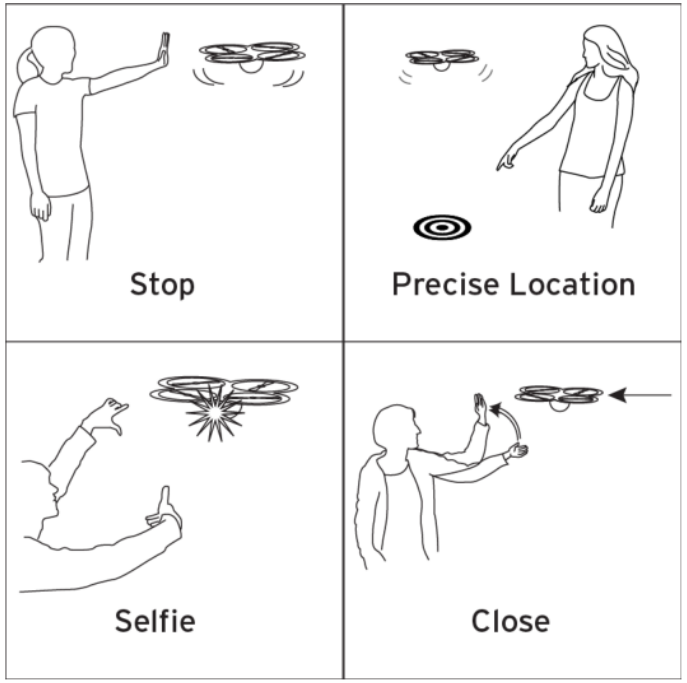
# Schedule

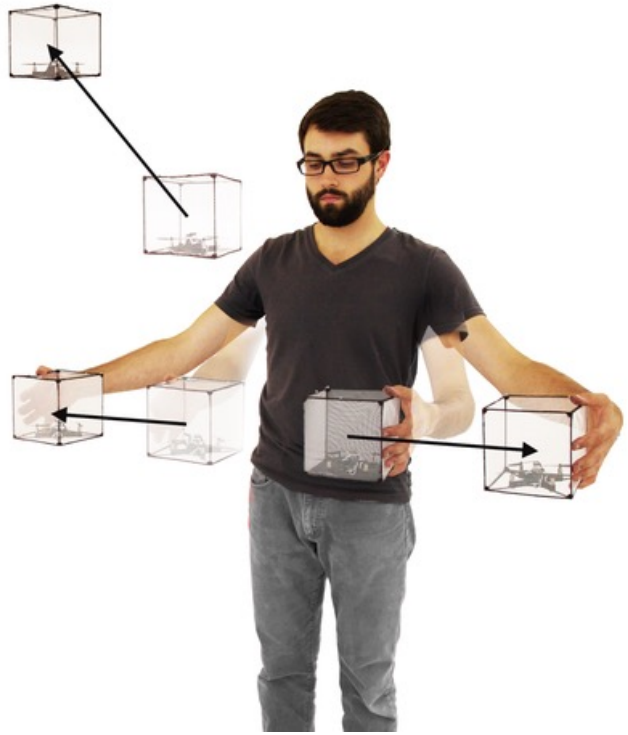
- Today
  - Introduction, HDI and scope of the workshop – 45’
  - Round table and Making groups – 30’
  - Video Brainstorming – 60’
    - Break – 15’
  - Pitch & Show your best & crazy ideas in 5’ – 45’
  - Start prototyping (and plan for evening drinks) – remaining’
- Tomorrow
  - Physical and digital prototyping – 90’
  - Demo time & Discussions – 60’

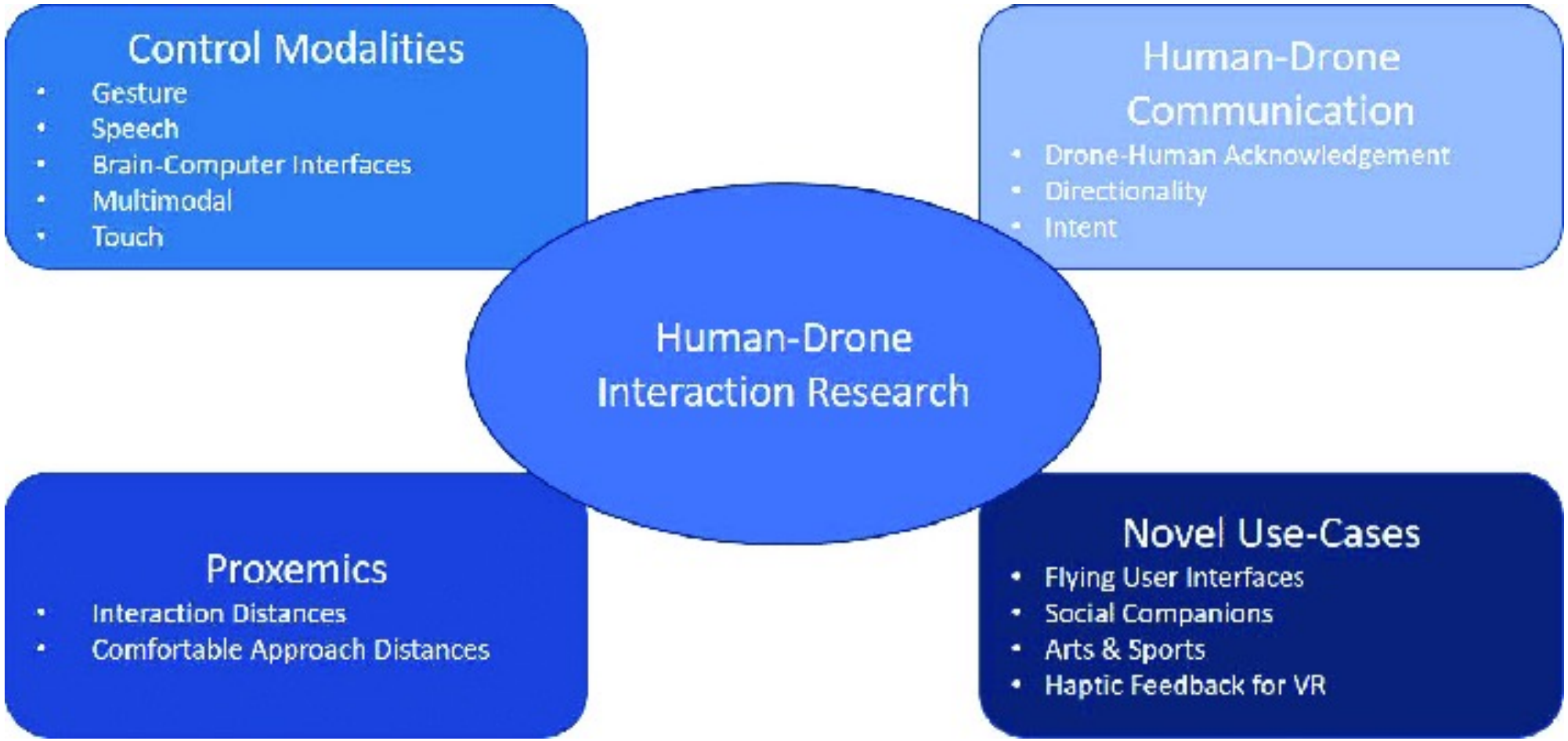
# Human Drone Interaction

Growing community in HCI and Robots communities

- CHI Paper and workshops, UIST, RoMan, HRI …

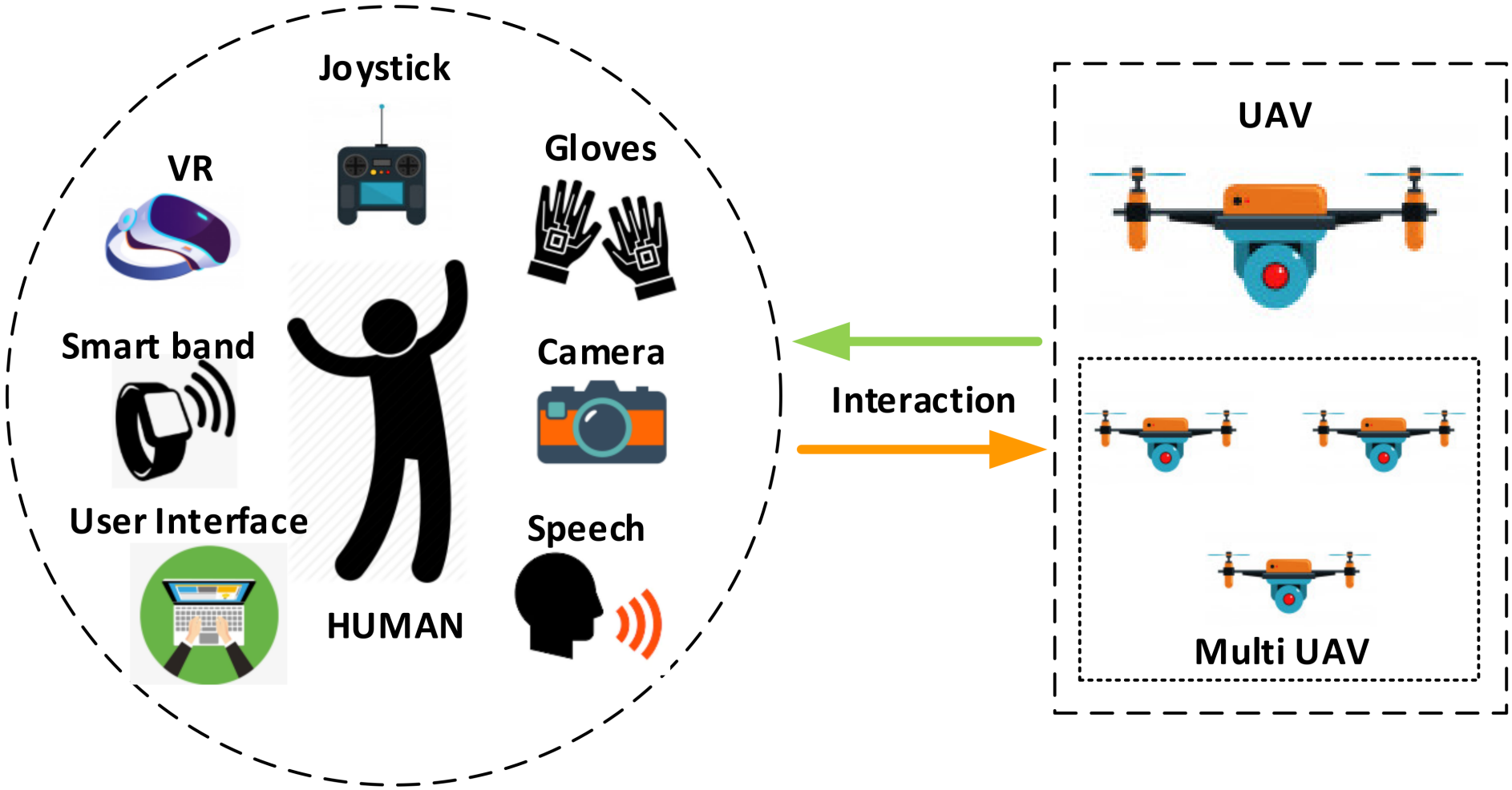




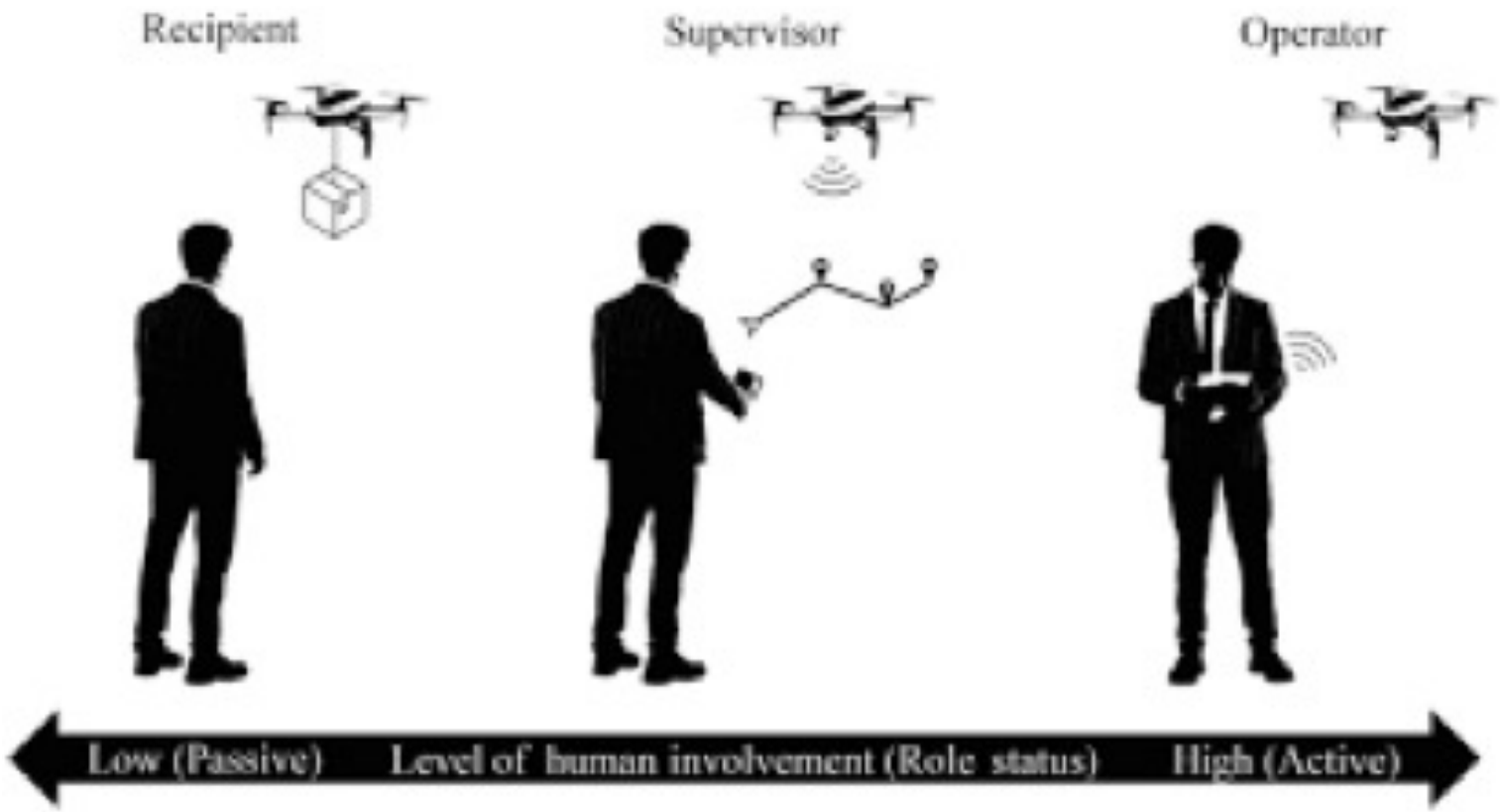

From Tezza and Andujar (2019)

# Control


Joystick
VR
Gloves
Smart band
Camera
User Interface
Speech
HUMAN
Interaction
UAV
Multi UAV

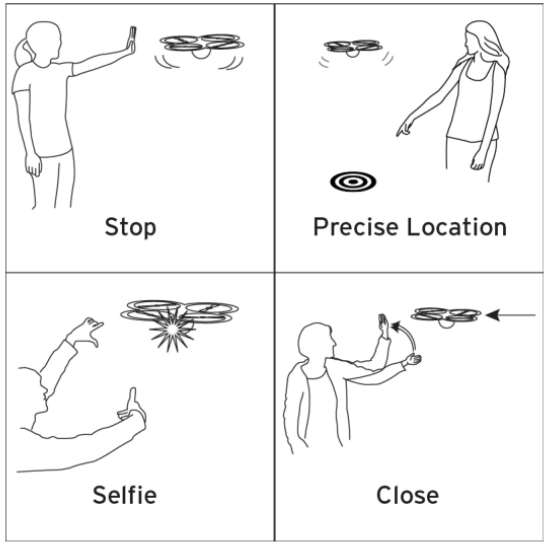
# Proxemics

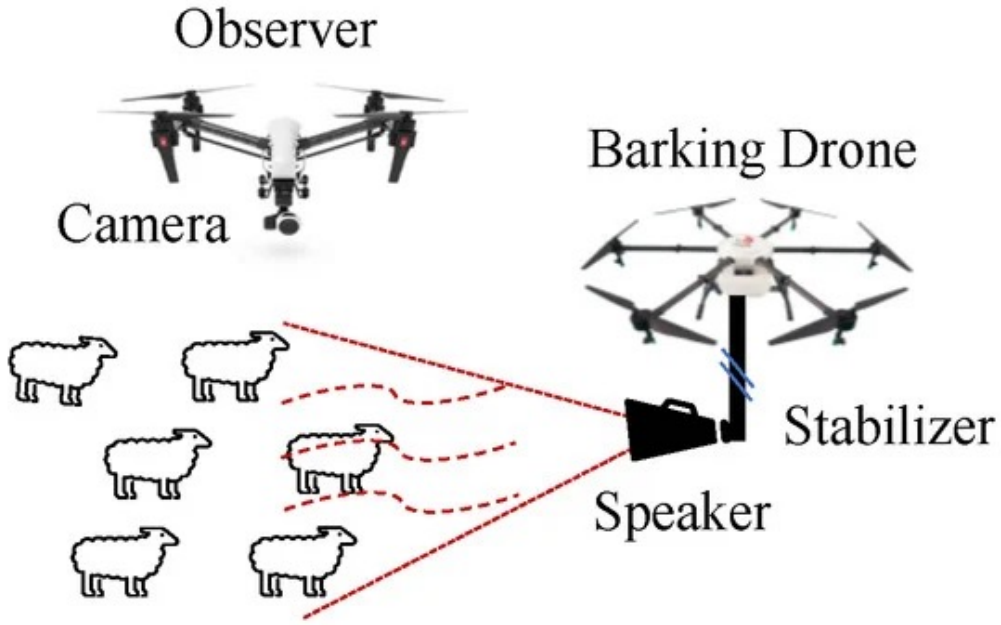
bystanders

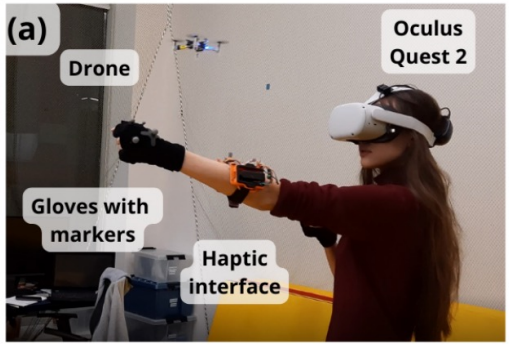


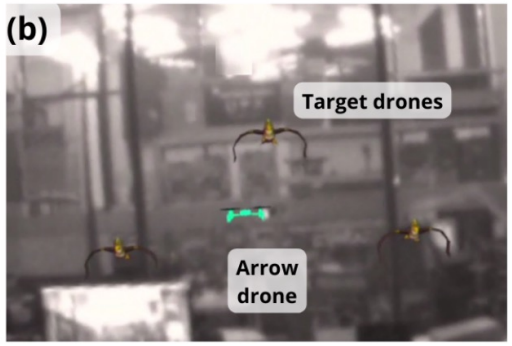

Albeaino (2022)

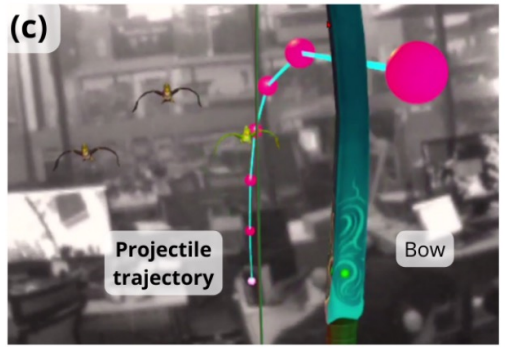
# Communication



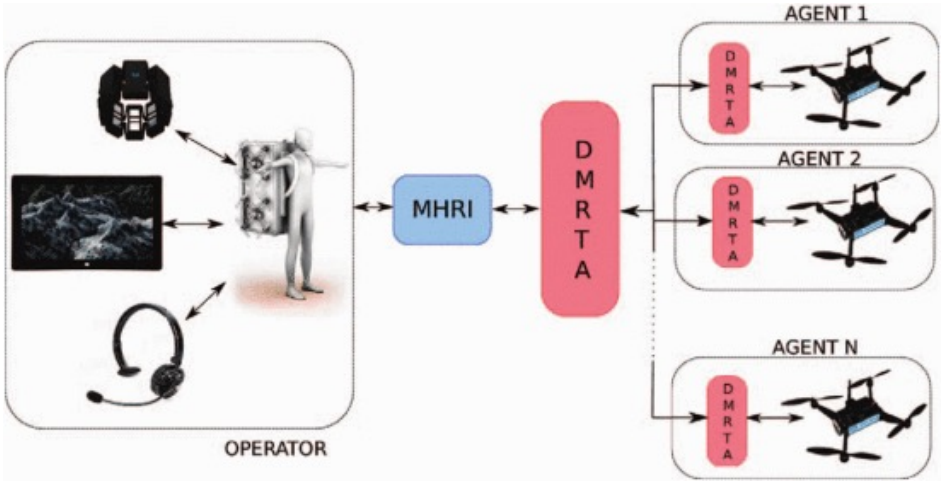


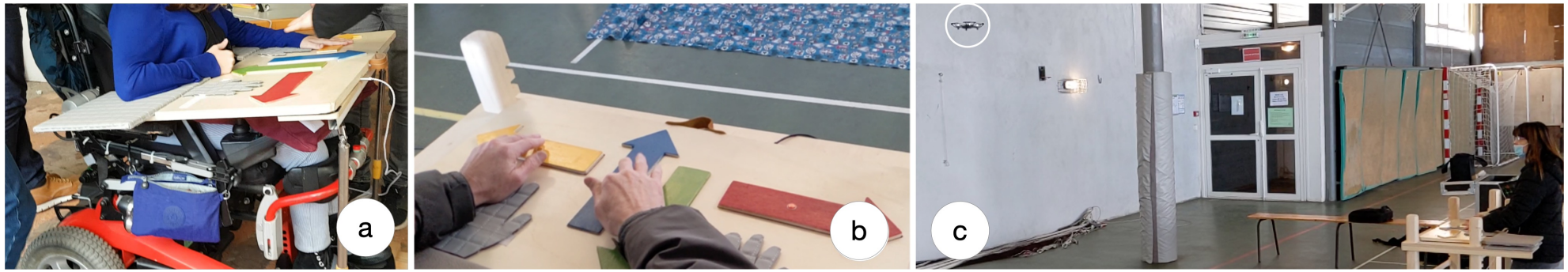



# Novel use cases



# Design challenge for today

From midjourney

## How drones can be operated with tangible objects and provide haptic feedback?

Use cases are up to your group

You can (must) go wild

# Technology for this workshop

- Motion sensor (Riot) – acceleration, rotations, sensors
- Tiny drones – CrazyFlies (Tello)
- Haptic feedback – LRA

(This list is extensible if you have stuff or needs)

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# Round Table & Making groups

- What’s your name?
- What is your experience with drones?
- What is your experience with Tangible Interaction
- What are your skills? (code – design - making)

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# Video Brainstorming – 1 hour

As a conventional brainstorming but each idea must be **acted** and **filmed**

Focus on **how** users will interact and what is the **feedback**

**Two or three ideas** per person must be shot!

**Think, prototype (rough), film** (many times)

Don’t be afraid of **stupid ideas**, you need at **least 3 per group**

For each idea, one member is the director, the other must comply.
If you don’t agree, after shooting, you become the director and redo it your way !

# Example!

“I want to change direction by twisting a sausage,
When I twist, it should make the sausage vibrates”

# Video Brainstorming – 1 hour

At the end, all groups need to **Pitch & Show your best & crazy ideas in 5’**
**Create a video gallery or slides or whatever!**

Do share all the videos with jeremie.garcia@enac.fr

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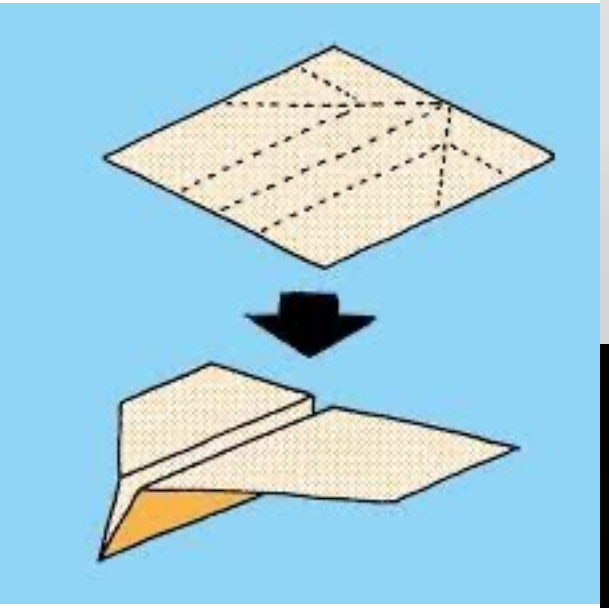
Showtime!

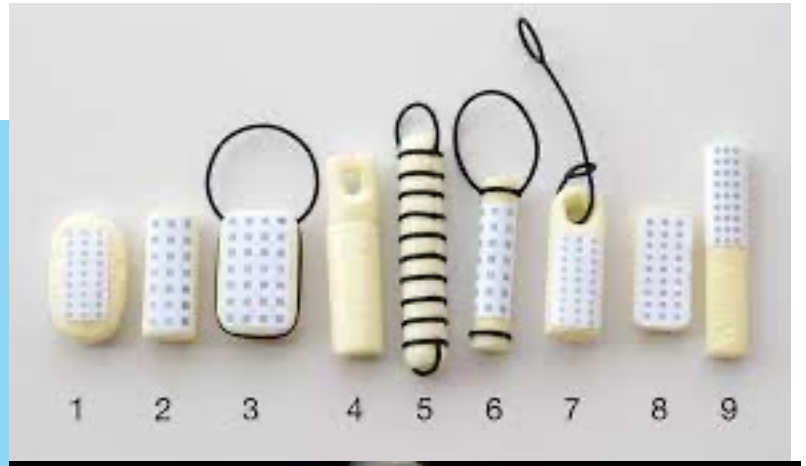
# Technology (code -demo)

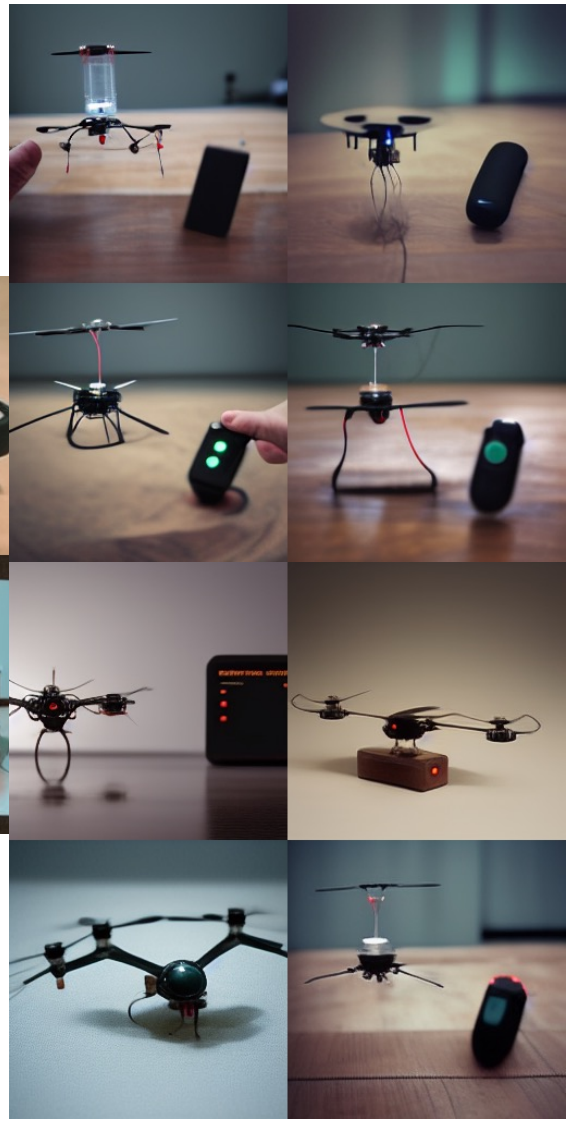
Github repository https://github.com/jeremie-garcia/dronible

# Prototyping – 90’

Let’s make flying and tangible prototypes







# Demo Time

Each group demonstrate their prototypes

We take videos and will share them all afterwards (if you are ok)

# Discussion

Is it worth operating drones with tangible objects and provide haptic feedback?

Was it fun?