

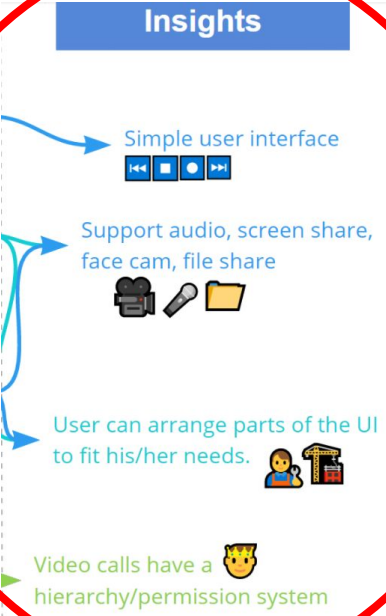
# Spatial Arrangement in Video Conferencing



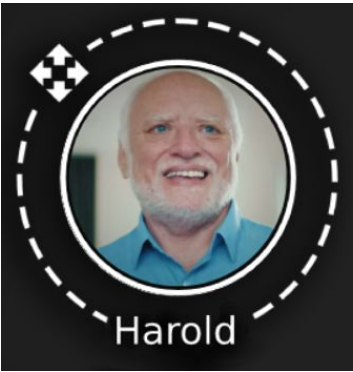
Team Limetten



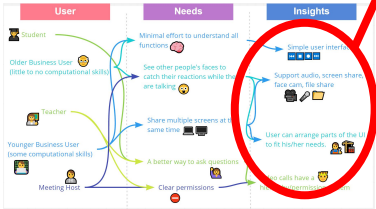
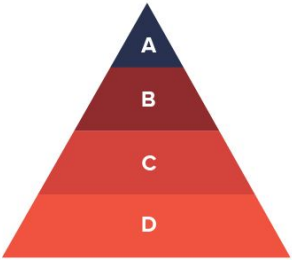
# Ideation



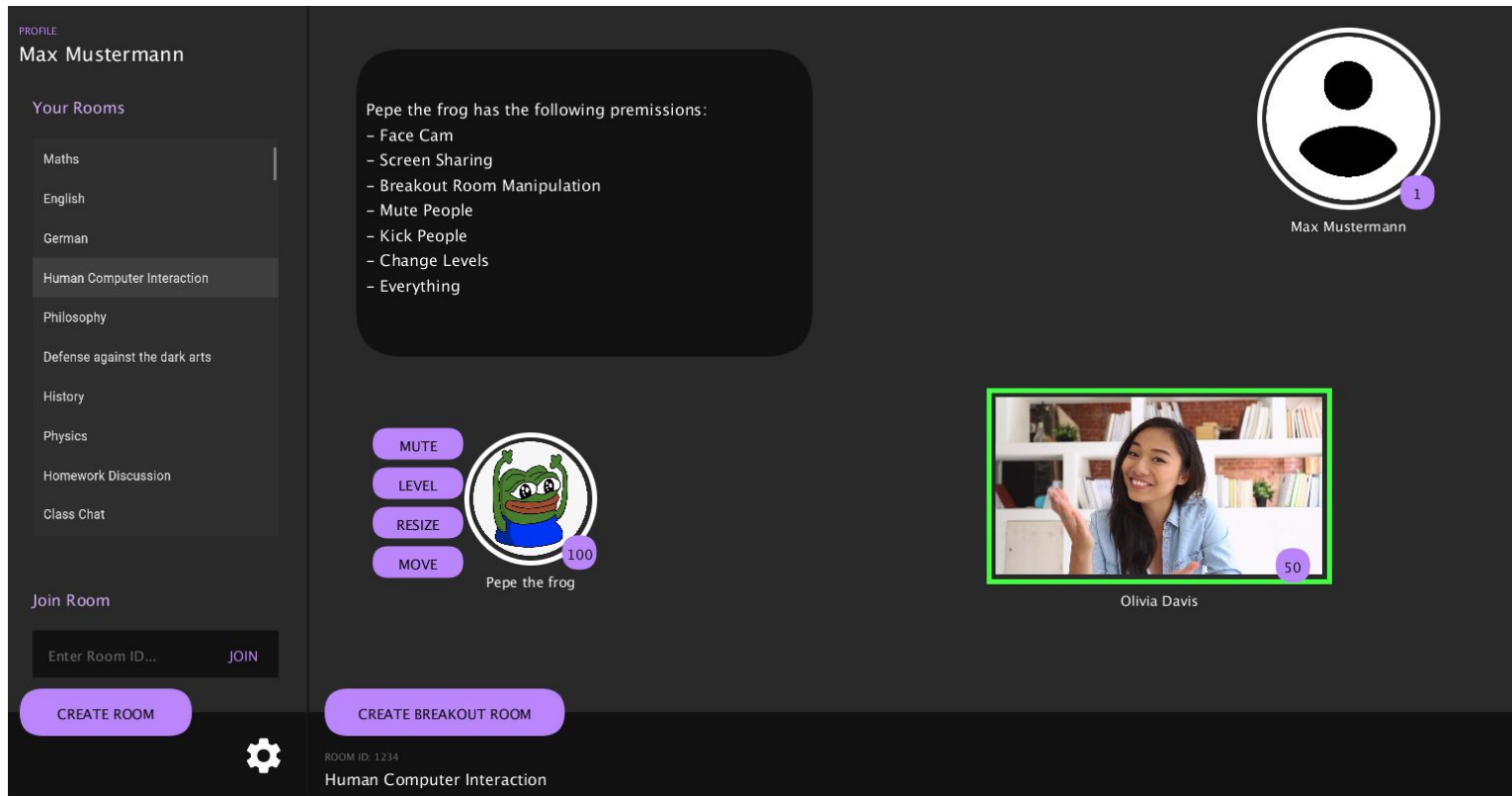
## User-specific Conference Arrangement



## Level-based Permissions



# Hifi Prototype



# Optimization

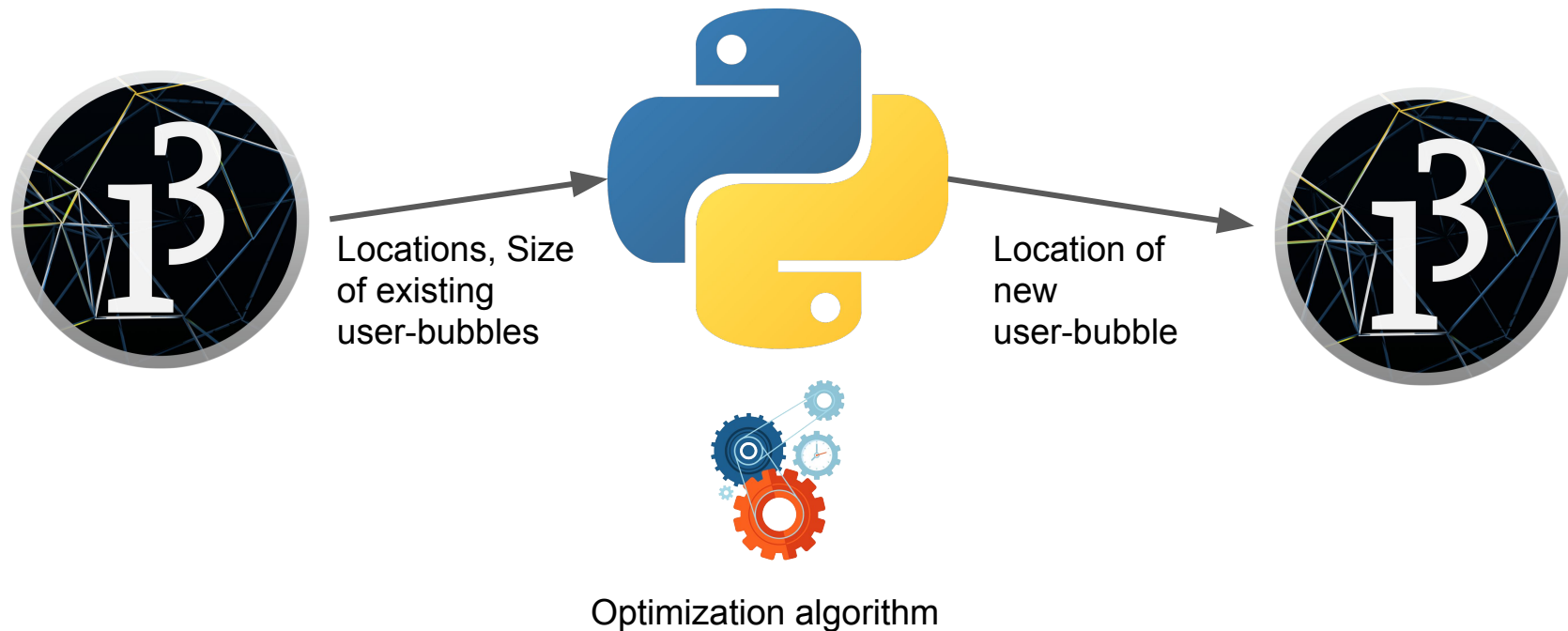
Which feature to optimize?

Feature	Variables
<b>Button Layout</b> Order of buttons when a user is clicked.	Order of button
<b>Cluttering Prevention</b> Position of each user when entering the room/session	x, y position
<b>Order of settings</b>	Order of buttons/input fields
<b>Priority order hierarchy</b> (screen share, muting, etc.)	Integer number



# Optimization

## Optimization pipeline



# Optimization

“Under the hood”



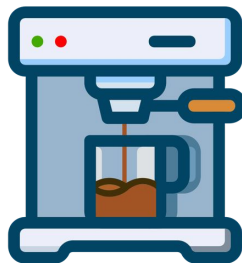
$x, y$  - position  
 $r$  - radius



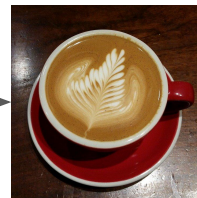
Non-linear  
constraints



Optimization target



Optimizer



Global minimum



Initial condition

# Optimization

## Optimizer Algorithm

### **States and Cost:**

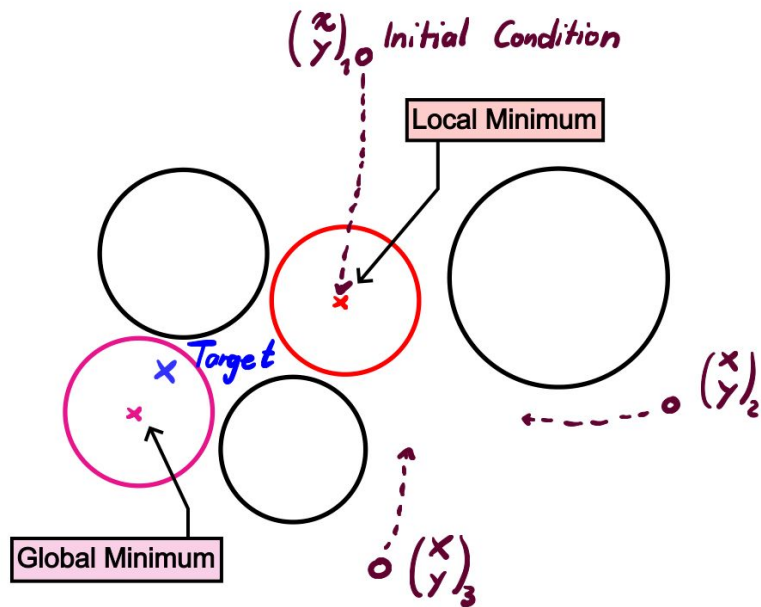
$$\vec{x}_{states} = \begin{pmatrix} x \\ y \end{pmatrix} \quad \min_{\vec{x}_{states}} \{J\} \quad J = \|\vec{x}_{states} - \vec{r}_{target}\|_2$$

### **Non-linear Constraints:**

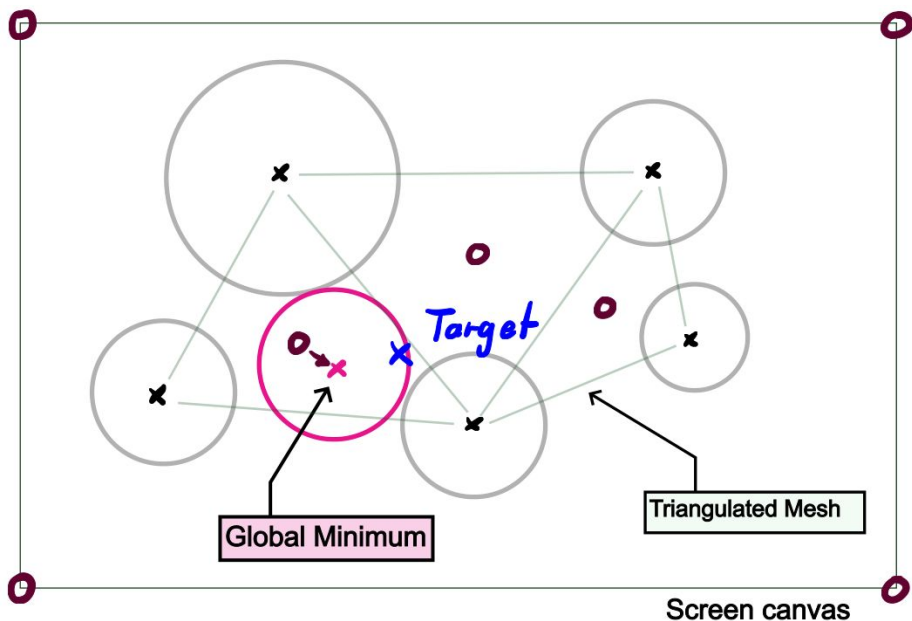
- $\|\vec{x}_{states} - \vec{r}_i\|_2 \geq r_{new} + r_i + h \quad \forall i \in \{User\}$
- $0 \leq x \leq Screen\ Width \quad 0 \leq y \leq Screen\ Height$

# Optimization

Initial condition and global minimum



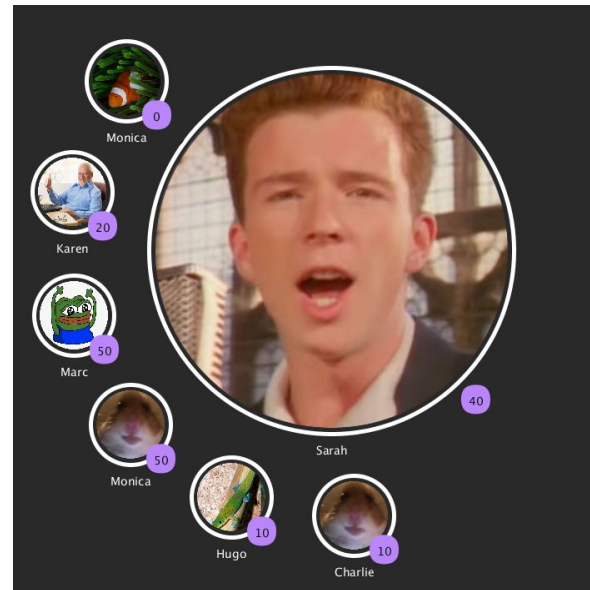
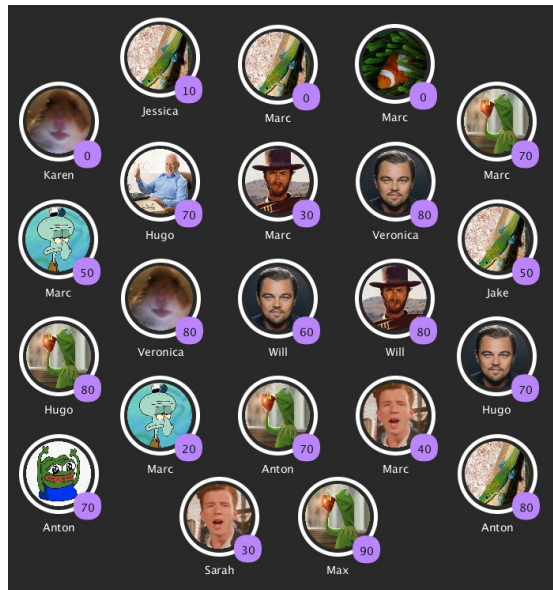
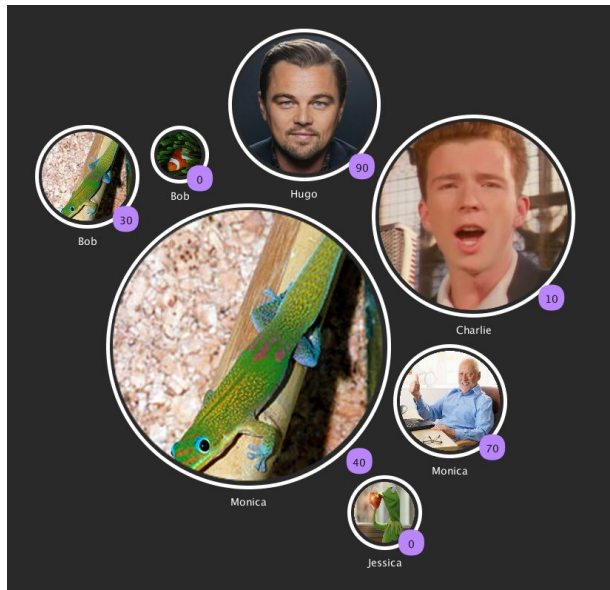
Random position of IC

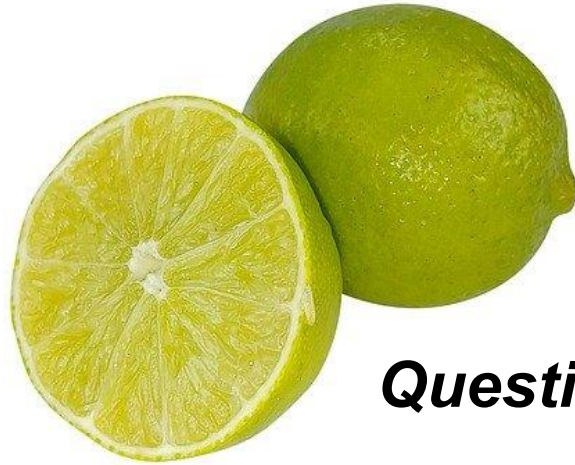


Triangulated mesh center as IC



# Results





***Questions?***