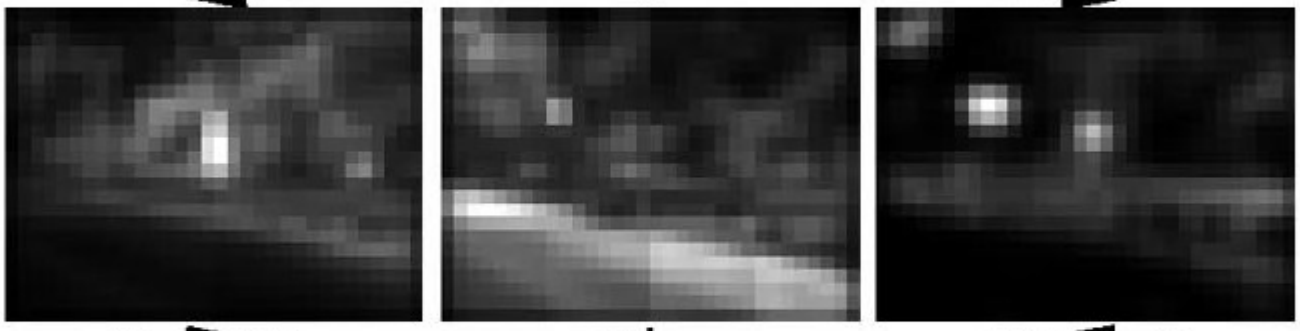
Which scene to show next on the big screen?

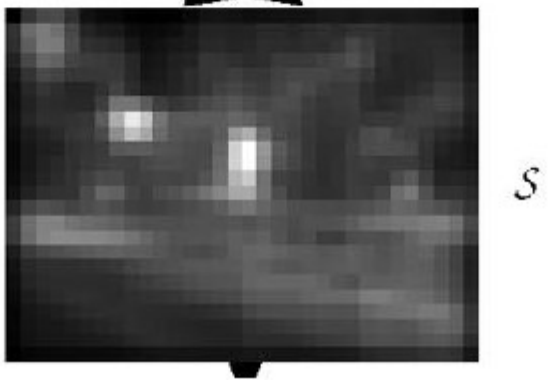
Idea: Using a Saliency Map to turn the Quadcopter towards „interesting“ Points

Input Image

Extract Features (ie. color channels, edges)



Normalize & Combine



Retrieving points that are interesting in several aspects:

$$Image: I(r,c),\ extracted\ Features\ F_i(r,c)$$

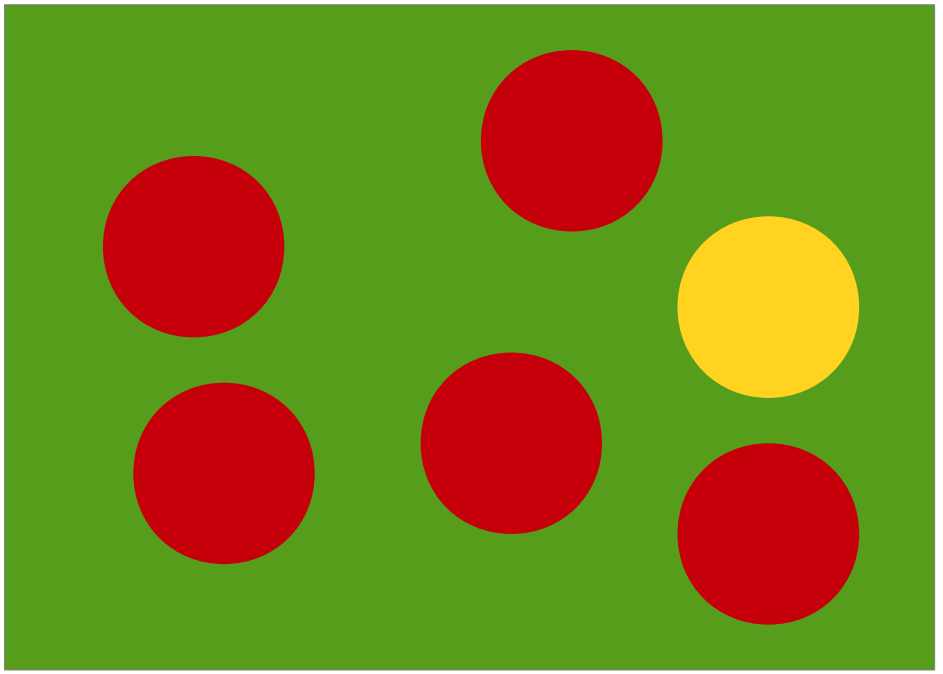
$$Normalized\ Features: N_i(r,c) = \frac{1}{\sum_{j,k} F_i(j,k)} F_i(r,c)$$

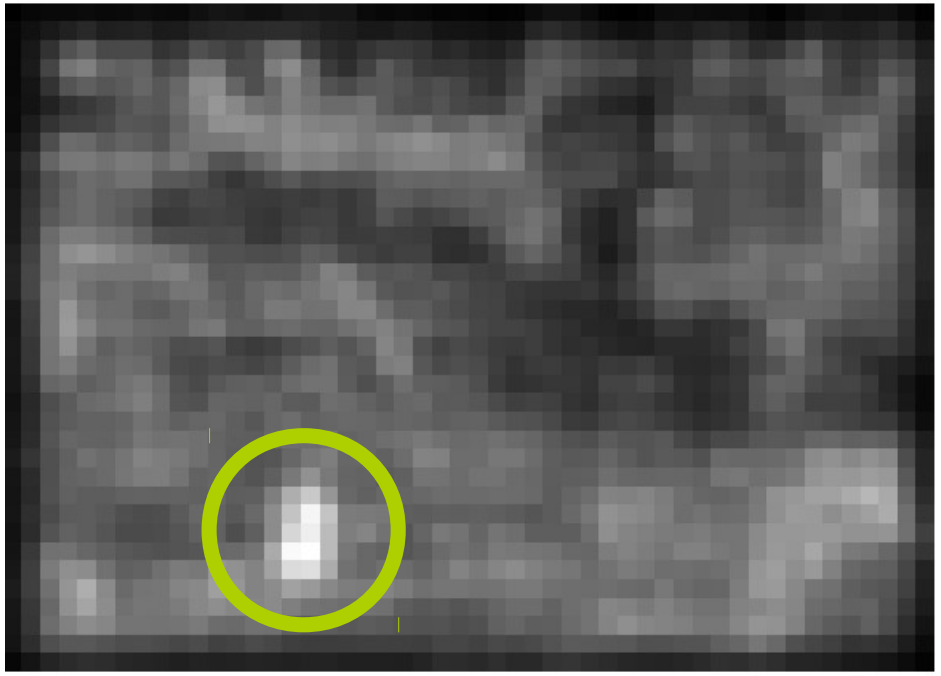
$$Saliency\ Map: S(r,c) = \frac{1}{n}\sum_{i=1}^{n} N_i(r,c)$$

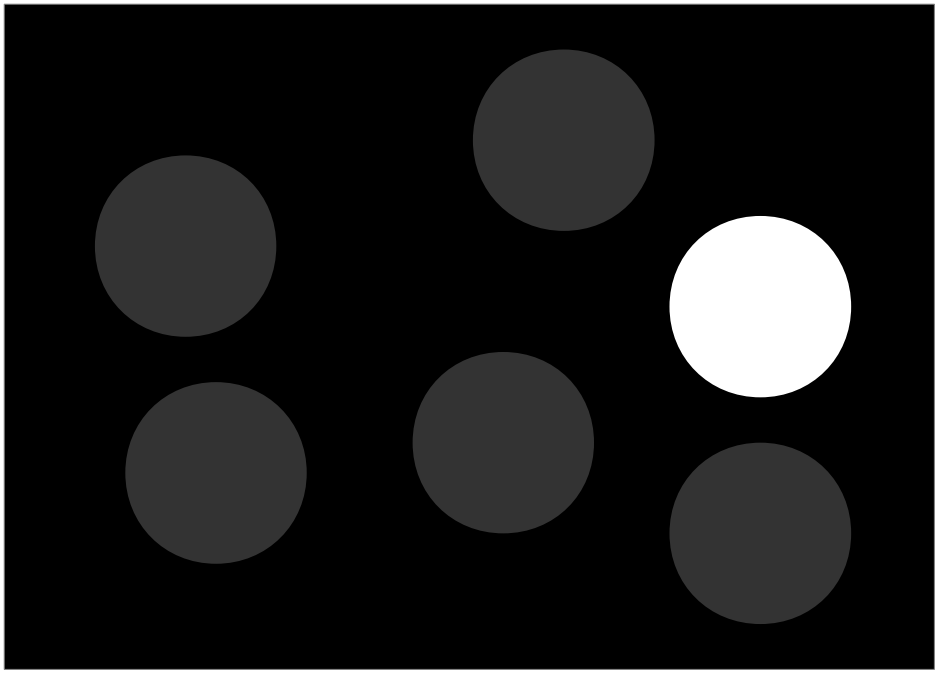
$$Finding\ the\ most\ interesting\ point: (r_{sal}, c_{sal}) = \max_{r,c}(S(r,c))$$

→ Resulting salient points:
outstanding in a certain way

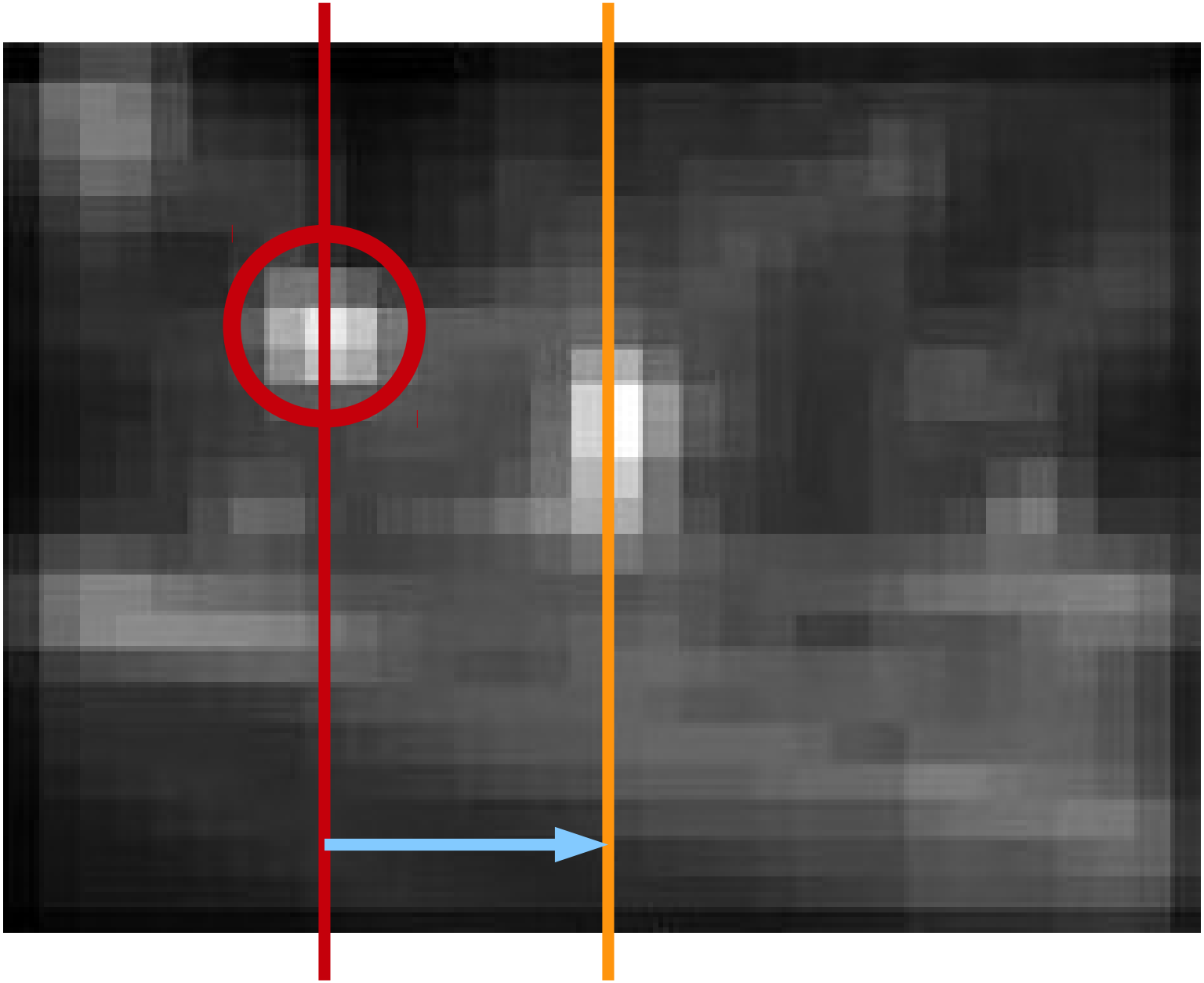
Examples







Having decided on the next most interesting point to face:



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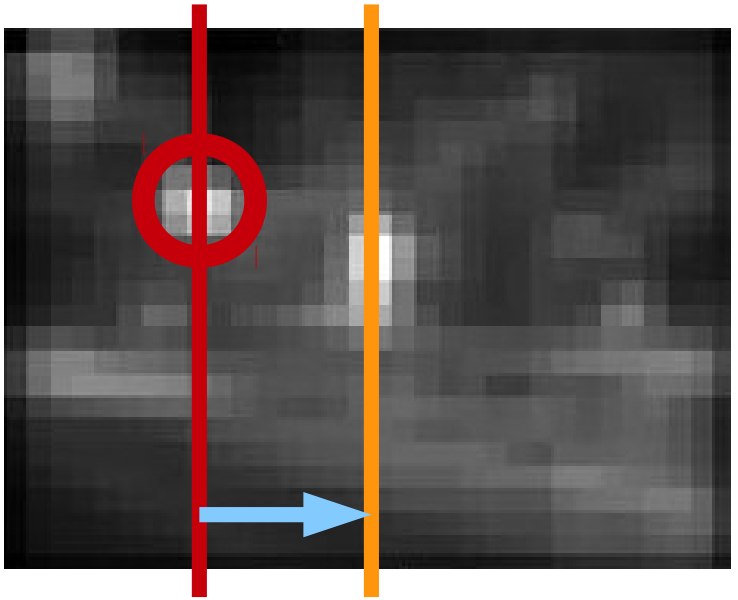

Control angle between next point of interest and vertical center line to zero!
e.g. P-Controller:

$$u_\alpha = K_p \alpha \quad with \quad \alpha = \arctan\left(\frac{c_{sal} - \frac{c_{max}}{2}}{f}\right)$$

Challenges

Robot should keep x/y position over marker

→ switching between cameras necessary

→ possible difficulties in position control

Future Work

Build up a map and avoiding collisions

→ Visit the interesting points instead of only looking at them!