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The Effects of Speed and Visual Emphasising on the Perception of Map Animations

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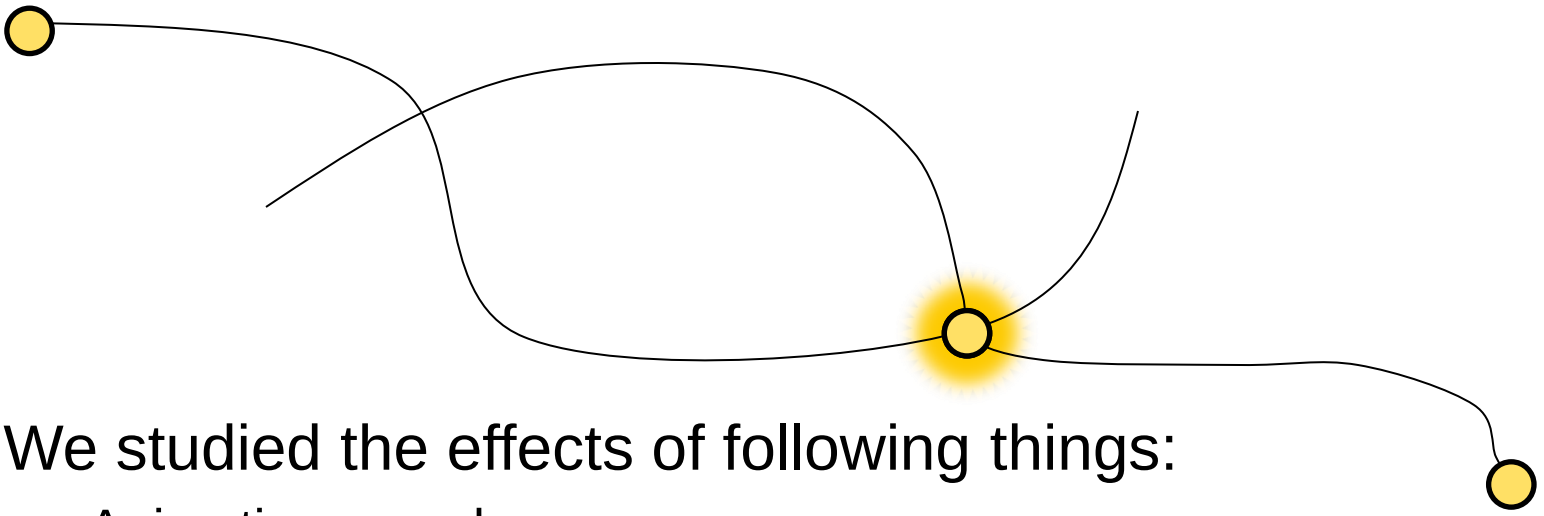
Focus of the research

- Detection of the lagged co-incidences in animation



- We studied the effects of following things:
  - Animation speed
  - Number of moving objects
  - Visual emphasising of potential event places

Two-phased user testing

- Scenario: geocaching
- First test specified the research questions
- 10 test animations containing 2-3 lagged co-incidences and some single stops as ”false alarms”
  - Slower and faster variation was made of all animations
- The test users answered on paper sheets

Analysis

- 39 accepted answers were taken into the analysis
- Propotion of right answers was calculated
- Two kind of erroneous answers
  - missed events (omissions)
  - erronously perceived events (co-missions)
- Statistical significance was tested with X^2

Results (second user test)

Slower animations 12 frames/s	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
Omissions %	5.6	7.4	5.6	0	1.6	0	1.6	7.1	22.2	34.9
Co-missions %	8.3	1.9	16.7	3.7	6.3	2.4	3.1	7.1	5.6	1.6
wrong answers %	13.9	9.3	22.3	3.7	9.5	7.2	6.3	14.2	27.8	36.5

Faster animations 18 frames/s	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
Omissions %	7.1	1.6	2.4	3.2	11.1	11.1	9.3	8.3	42.9	31.5
Co-missions %	0	0	7.1	0	0	2.8	1.9	5.6	2.3	3.7
wrong answers %	11.9	4.8	9.5	3.2	13.0	13.9	11.2	13.9	45.2	40.8

The most important findings

- Highlighting the important things betters the results
  - Animations 9 and 10 did not include the hotspots!
- Speeding up the animation increases the number of missed events
  - Interestingly, it also decreases the number of false perceptions!
- Number of objects did not influenced in perception after certain treshold value (here: 10 points)
  - The hotspots became ”meaningful objects” to follow, not the points themself anymore
  - The appearance of the hotspots is a clear visual attractor

Conclusions

- The speed of the animation should be chosen according to not only the phenomenon, but also the user's task
  - Is it more critical to make false detections than to miss something?
- The potential events should be emphasised visually
  - How these potential places could be calculated from the data?
  - What are the best visual methods for emphasising?