

Kognitive aspekter ved beslutninger i høy fart – tunnelsyn, kartlesing og mental rotasjon



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To personer omkom i båtulykken

Adresseavisen

NRK

Politiet: – Dette er en forferdelig trist ulykke

Det var regn og svært mørkt i området da Vibeke Skofterud kjørte vannskuter og traff land. – Området er preget av mye holmer og skjær, sier skipper på redningskøyten, som fant Skofterud, Asbjørn Rønning.





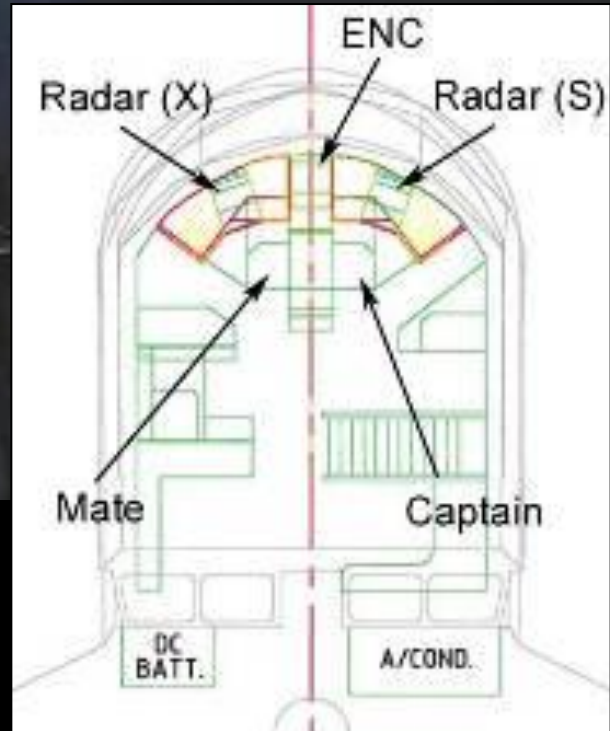
HSC Sleipner, November 1999

MV "Sleipner" - new in august 99, sank after running ashore
outside Ryvarden, in the northern part of Sletta tonight. (Friday nov. 26)
This picture was taken nov 3 in Haugesund.

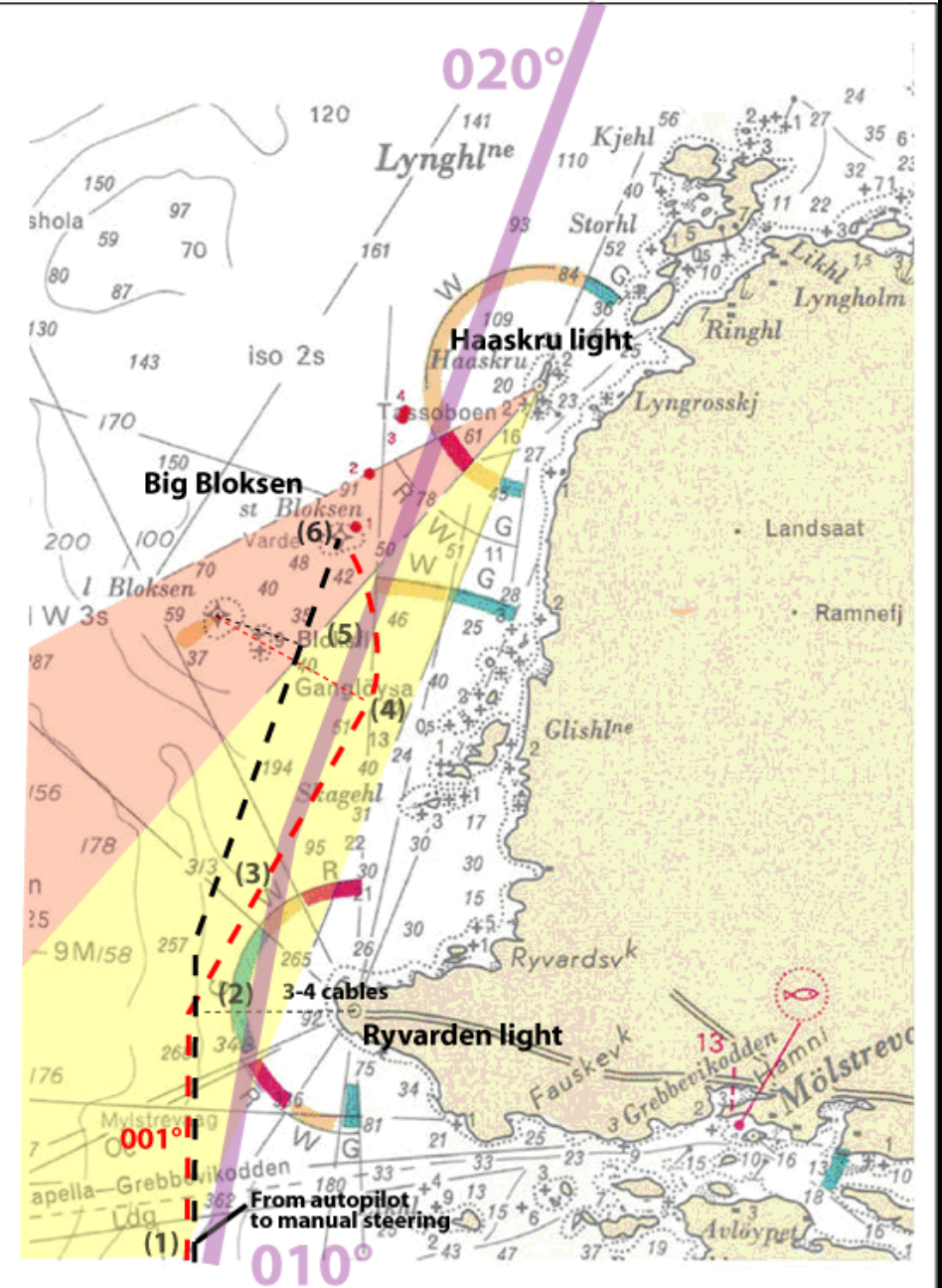
(c) Eirik Hustvedt



Figur 6.1 Bilde av Store Bloksen sett mot øst⁸



The identical bridge on Sleipner's sister ship Draupner

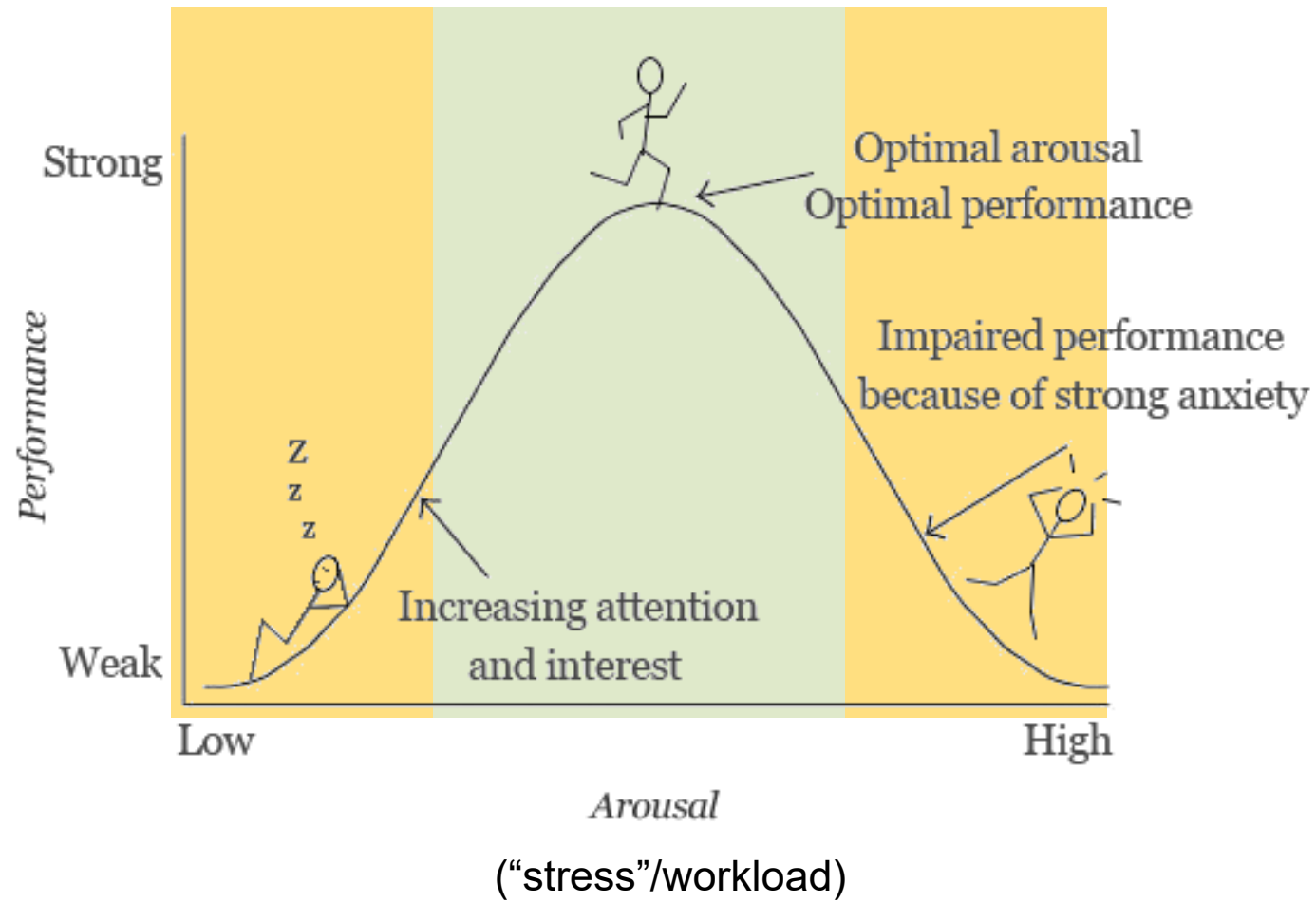


Positions of the wreckage:

- 1. Starboard Main Engine
- 2. Main Section of the Ship
- 3. Panels
- 4. The Bow Section

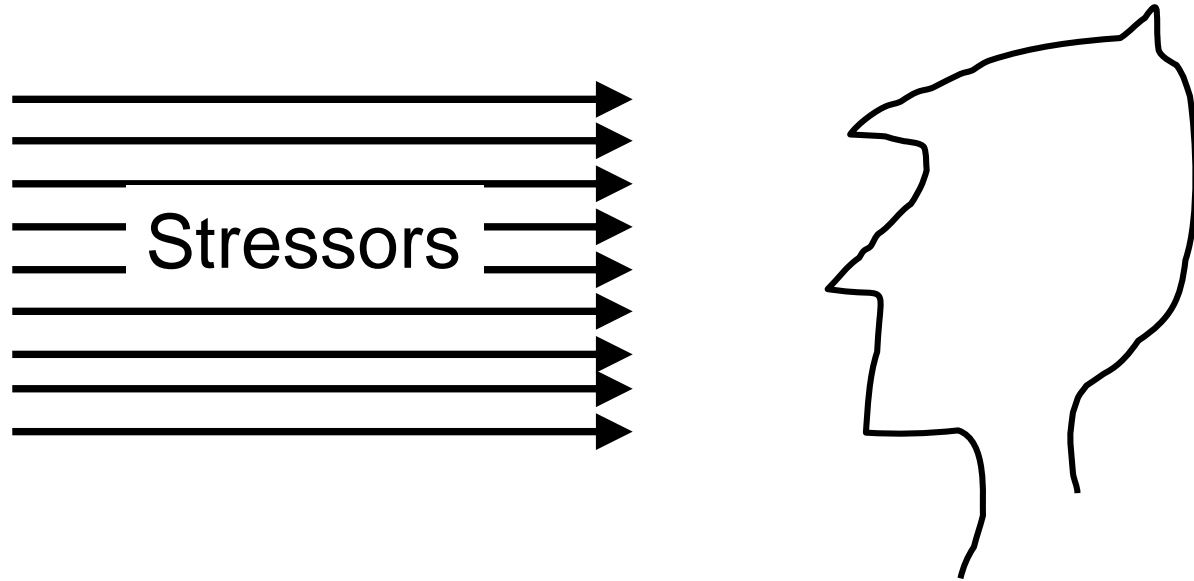
- - - - The course according to the captain
- - - - The course according to the court
- The course in the passage plan

Workload, contextual control levels

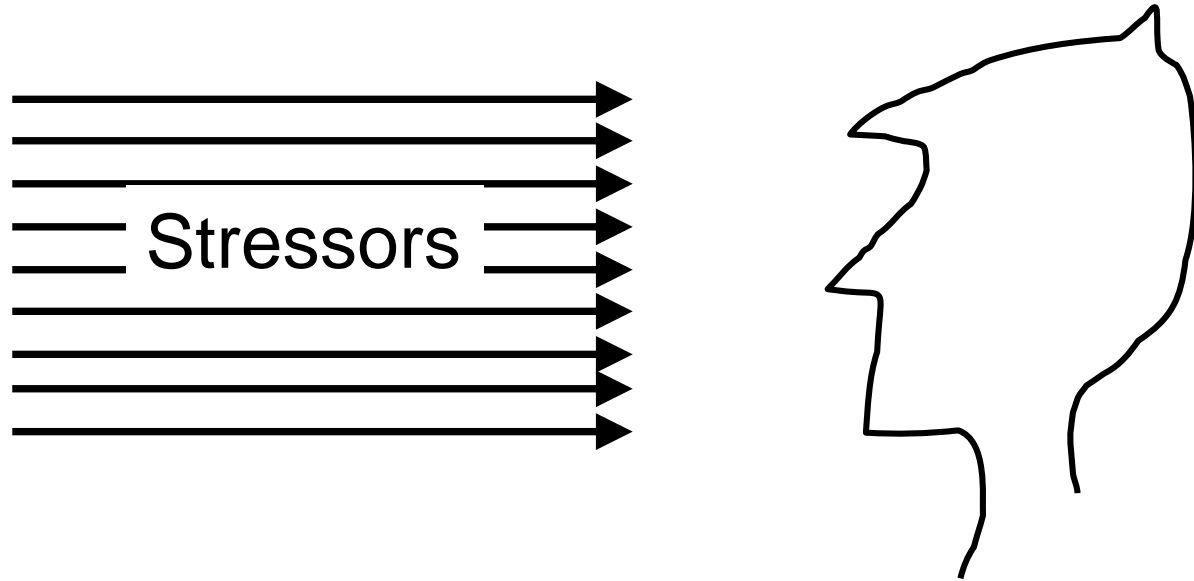


The Yerkes–Dodson law (mice studies, 1908)

Stress Component Effects

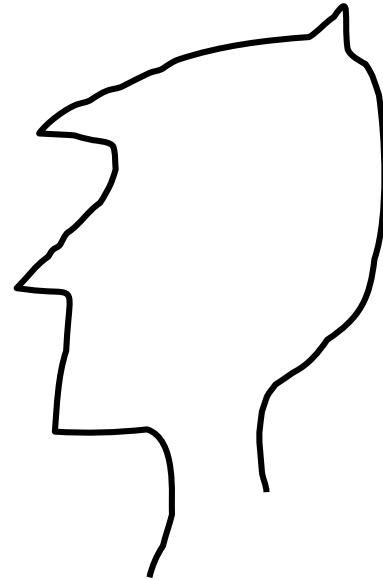
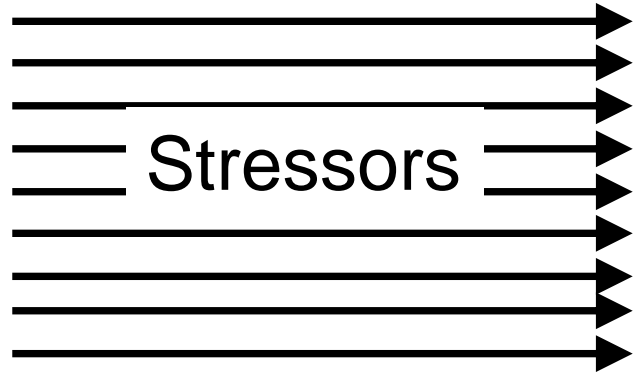


Stress Component Effects



- Selective attention ("tunnelling")
- Working memory loss
- Preservation (confirmation bias)
- Coping

Stress Component Effects



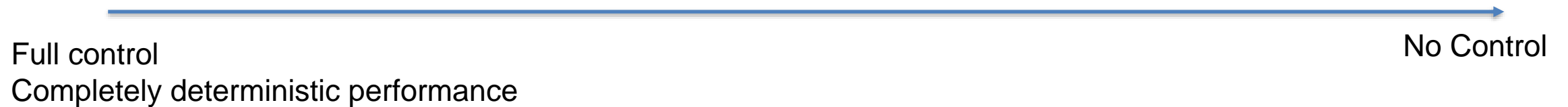
Coping techniques

- Selective attention ("tunnelling")
- Working memory loss
- Preservation (confirmation bias)
- Coping

- Recrute ressources ("try harder")
- Remove stressors
- Strategic adaptation (change goals)
- Do nothing

Contextual Control Model (COCOM), Erik Hollnagel, 2005

Levels of Control



Hollnagel, E & Woods, D.D. (2005). *Joint Cognitive Systems: Foundations of Cognitive Systems Engineering*. CRC Press

Contextual Control Model (COCOM), Erik Hollnagel, 2005

Levels of Control

Strategic

Tactical

Opportunistic

Scrambled

Full control
Completely deterministic performance

No Control

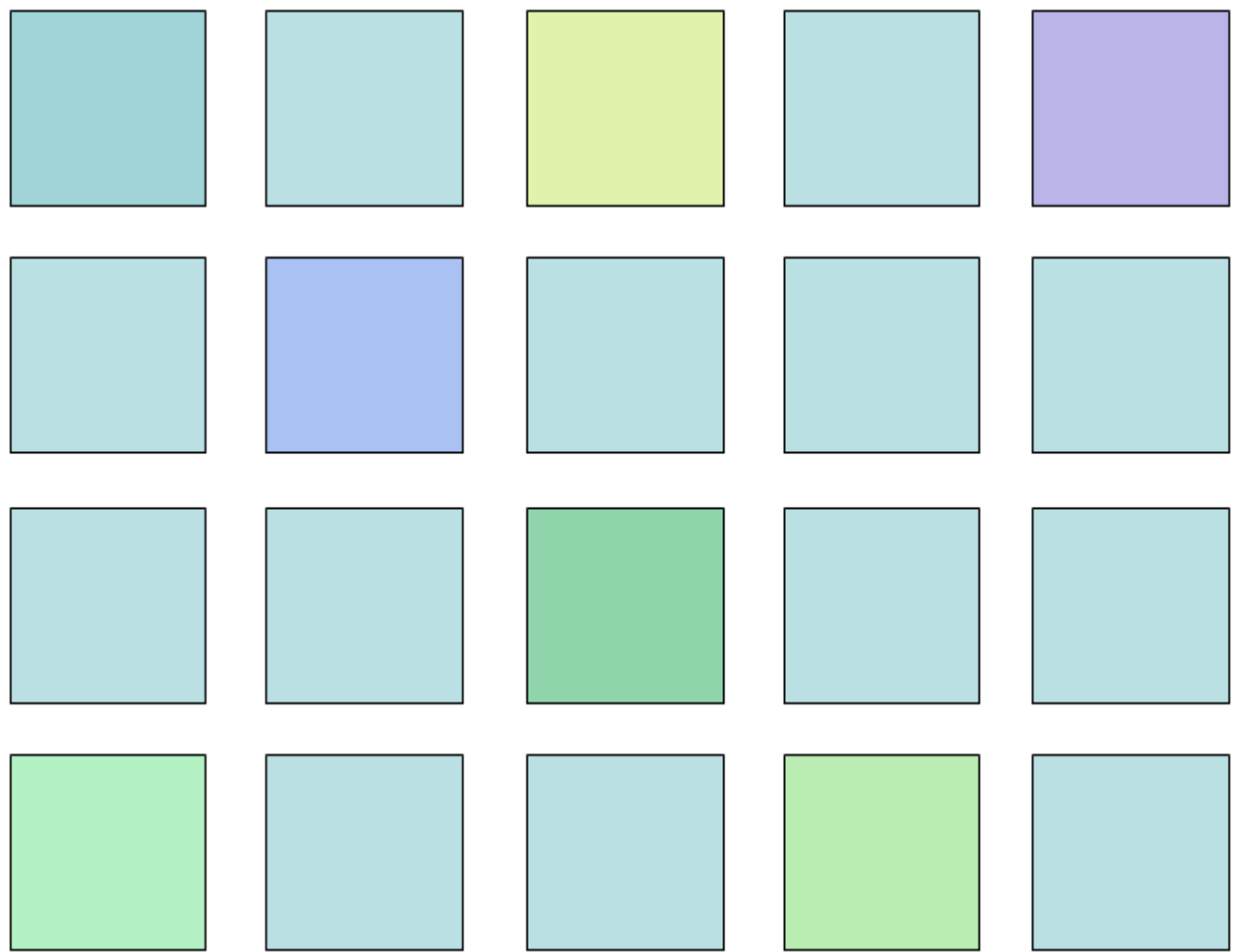
Hollnagel, E & Woods, D.D. (2005). *Joint Cognitive Systems: Foundations of Cognitive Systems Engineering*. CRC Press

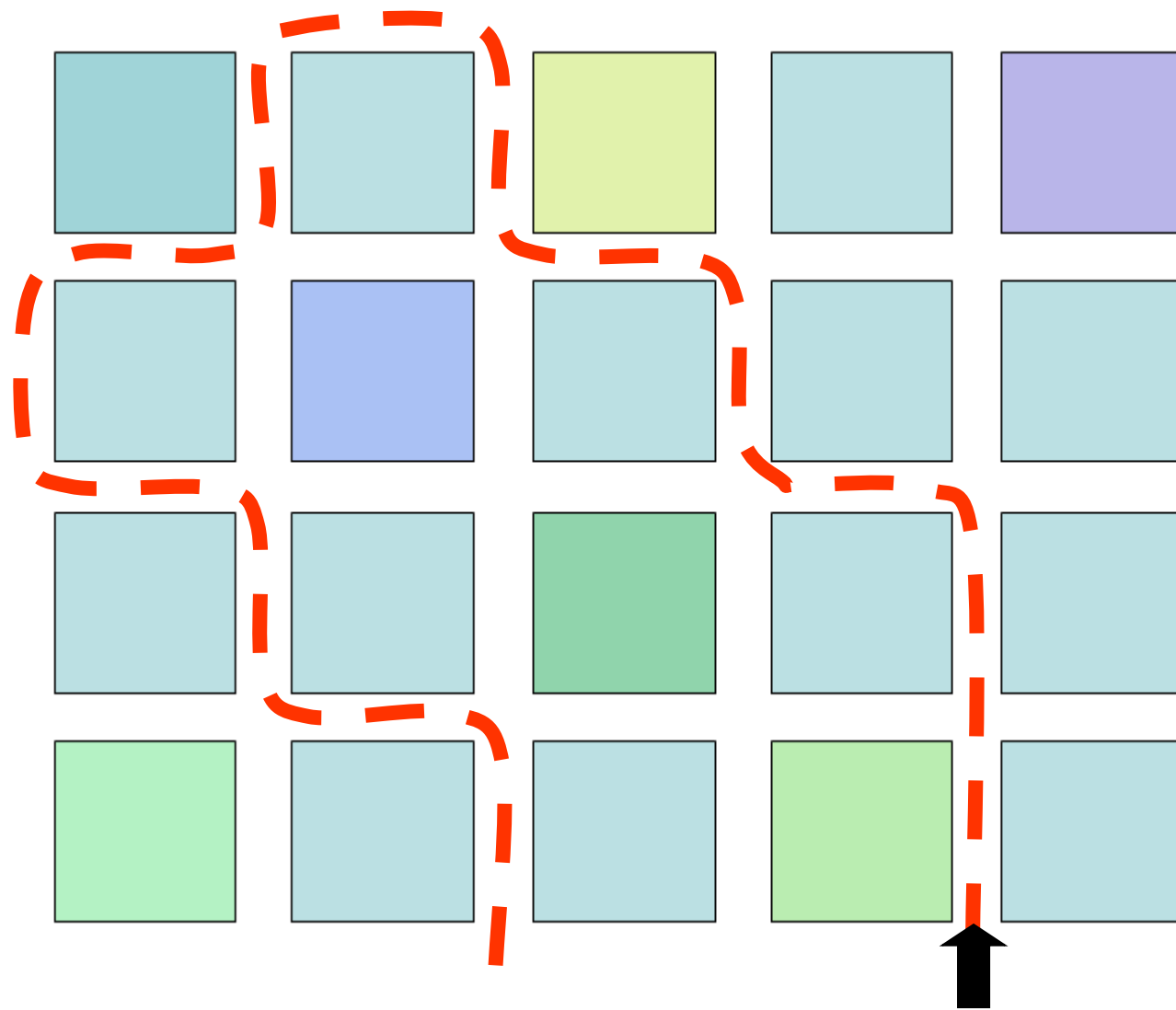
Contextual Control Model (COCOM), Erik Hollnagel, 2005

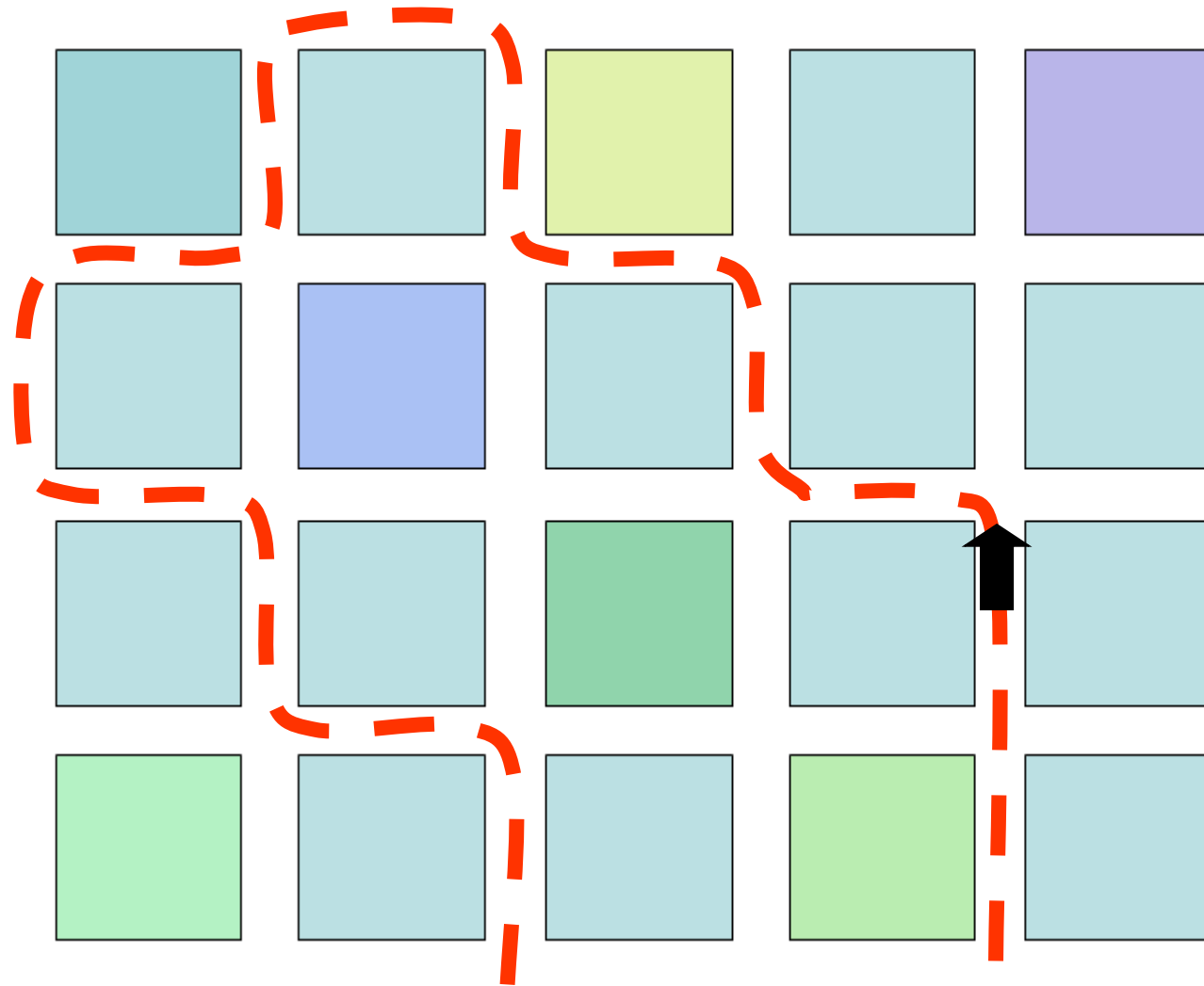
Control mode	Number of goals	Subjectively available time	Evaluation of outcome	Selection of action
Strategic	Several	Abundant	Elaborate	Based on modes/predictions
Tactical	Several (limited)	Adequate	Detailed	Based on plans/experience
Opportunistic	One or two (competing)	Just adequate	Concrete	Based on habits/association
Scrambled	One	Inadequate	Rudimentary	Random

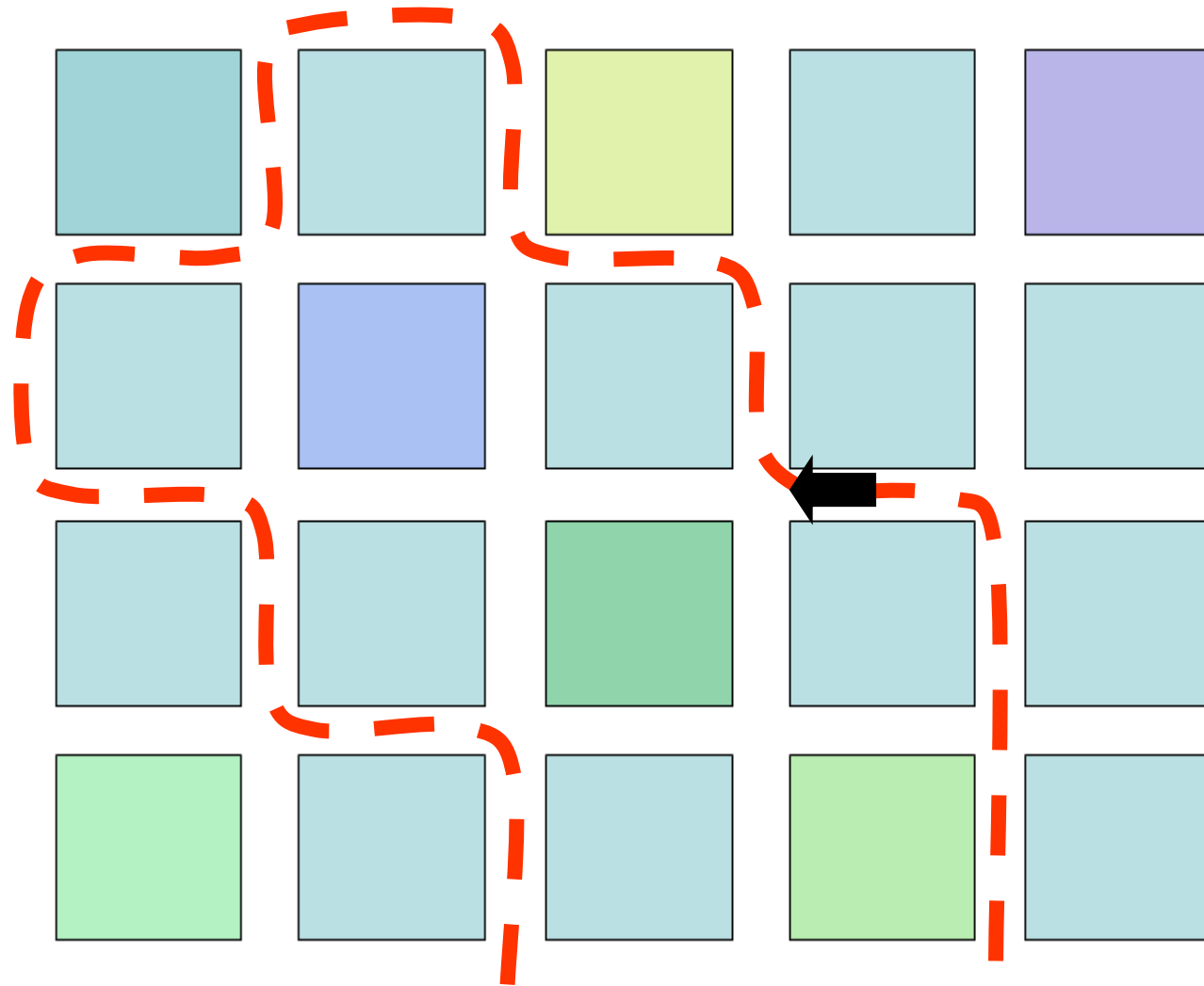
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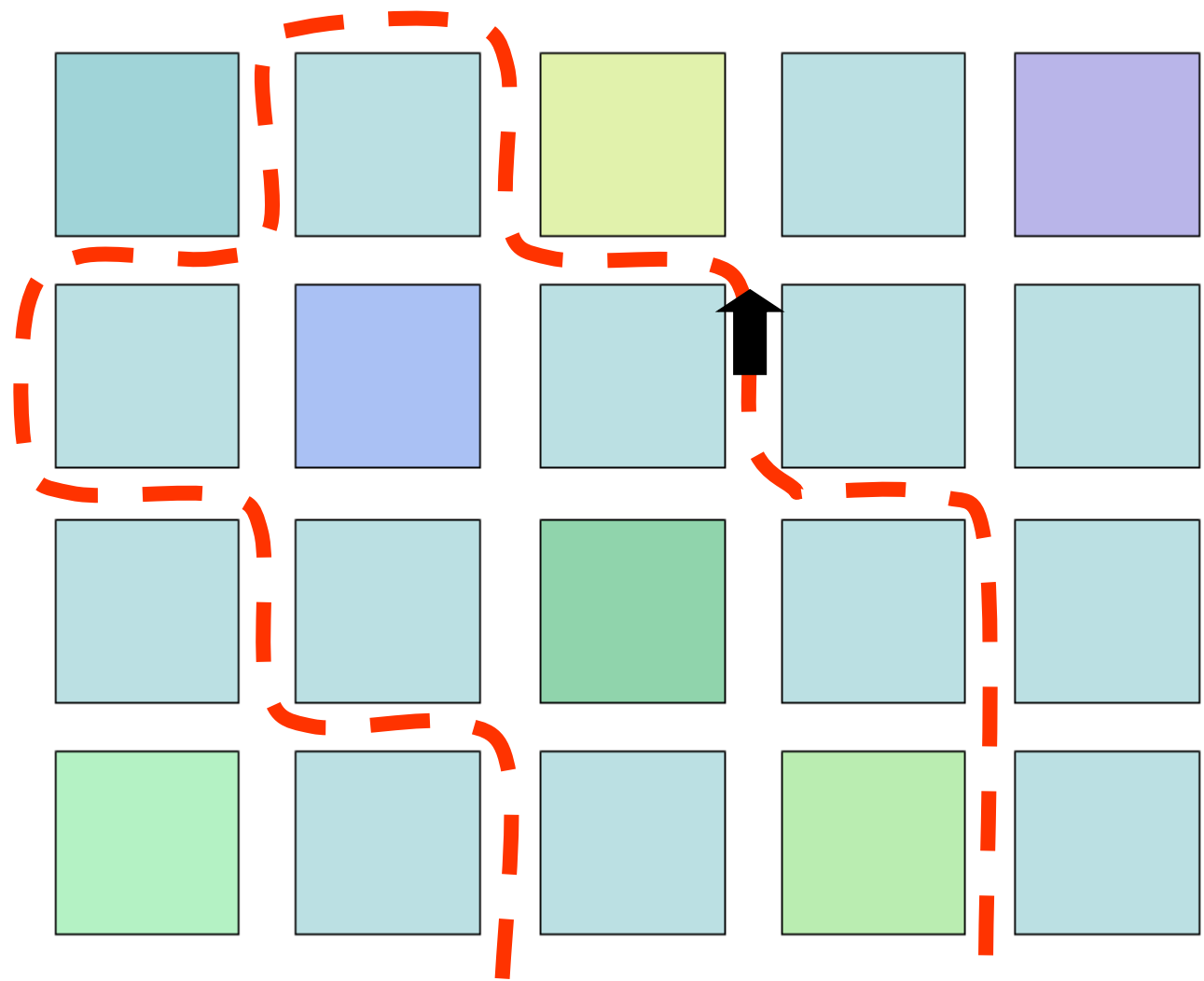
Mental rotations

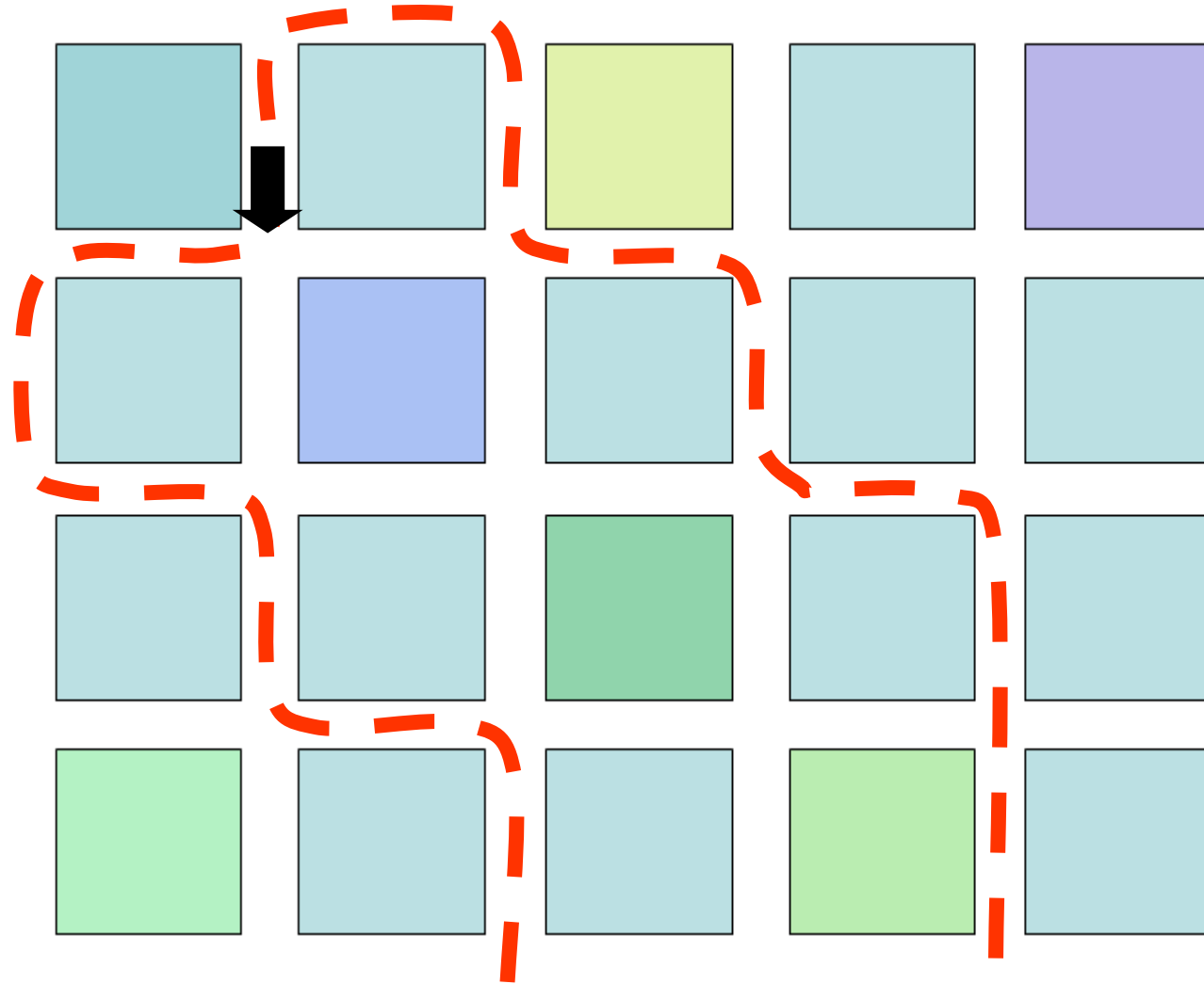


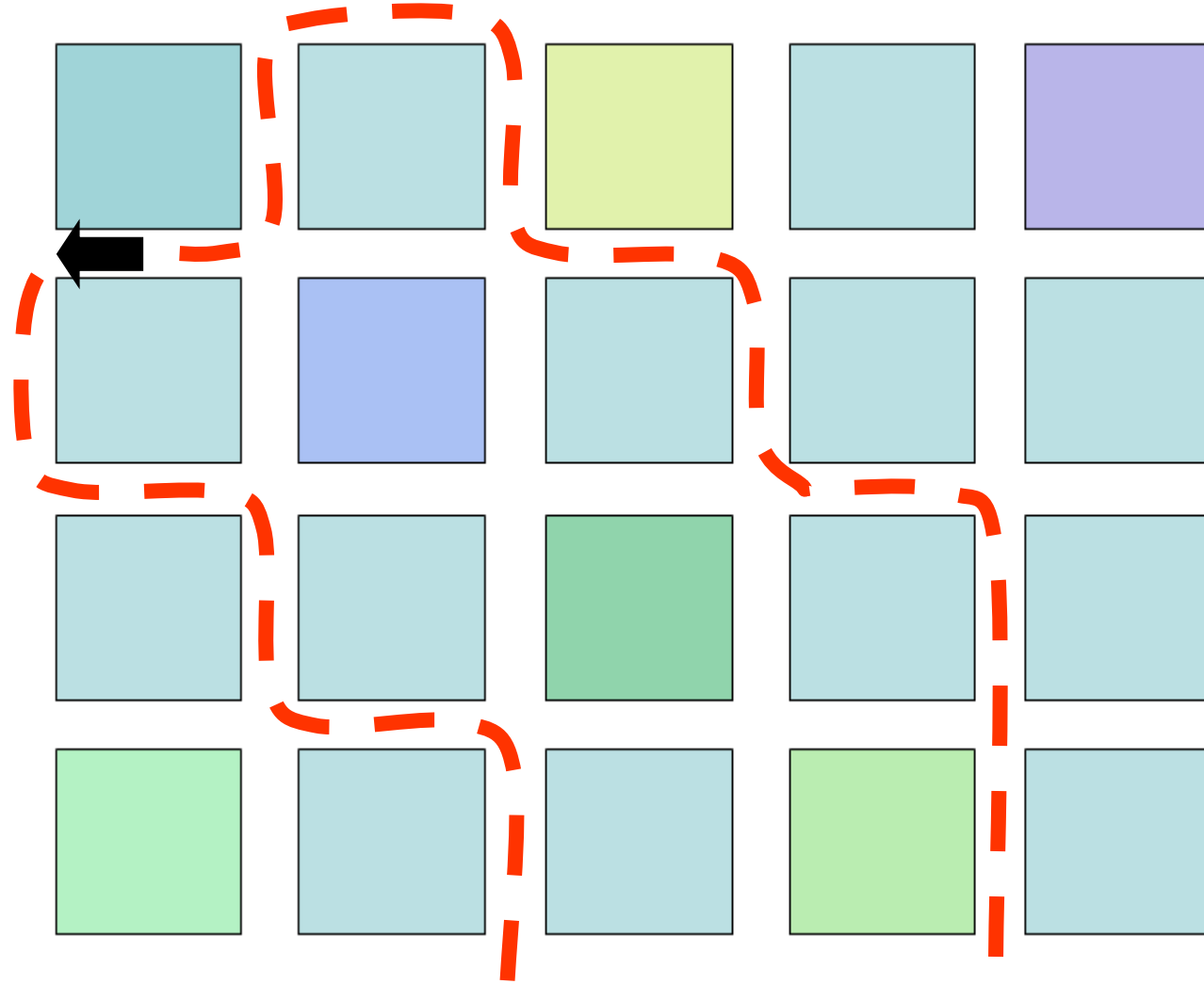


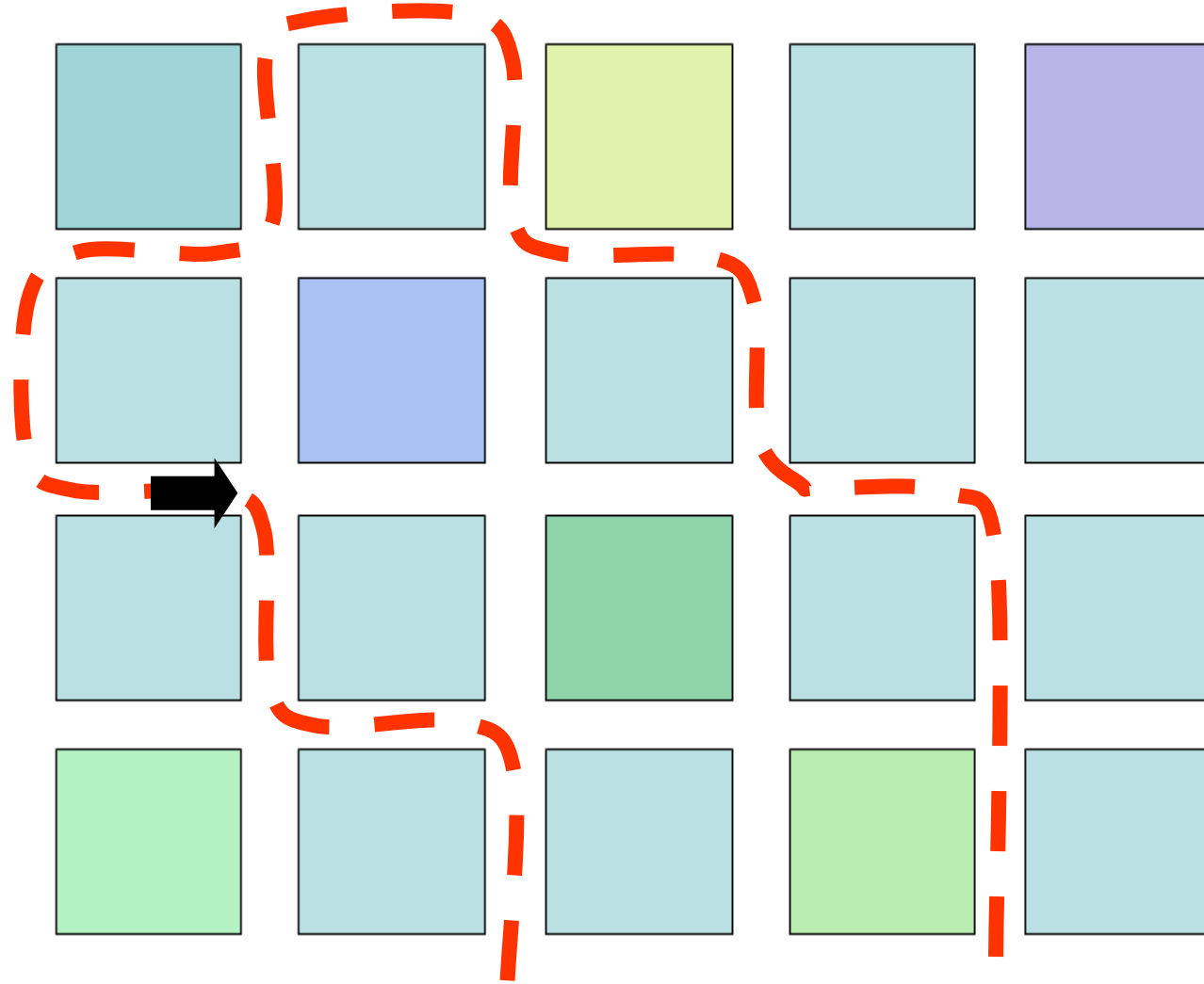


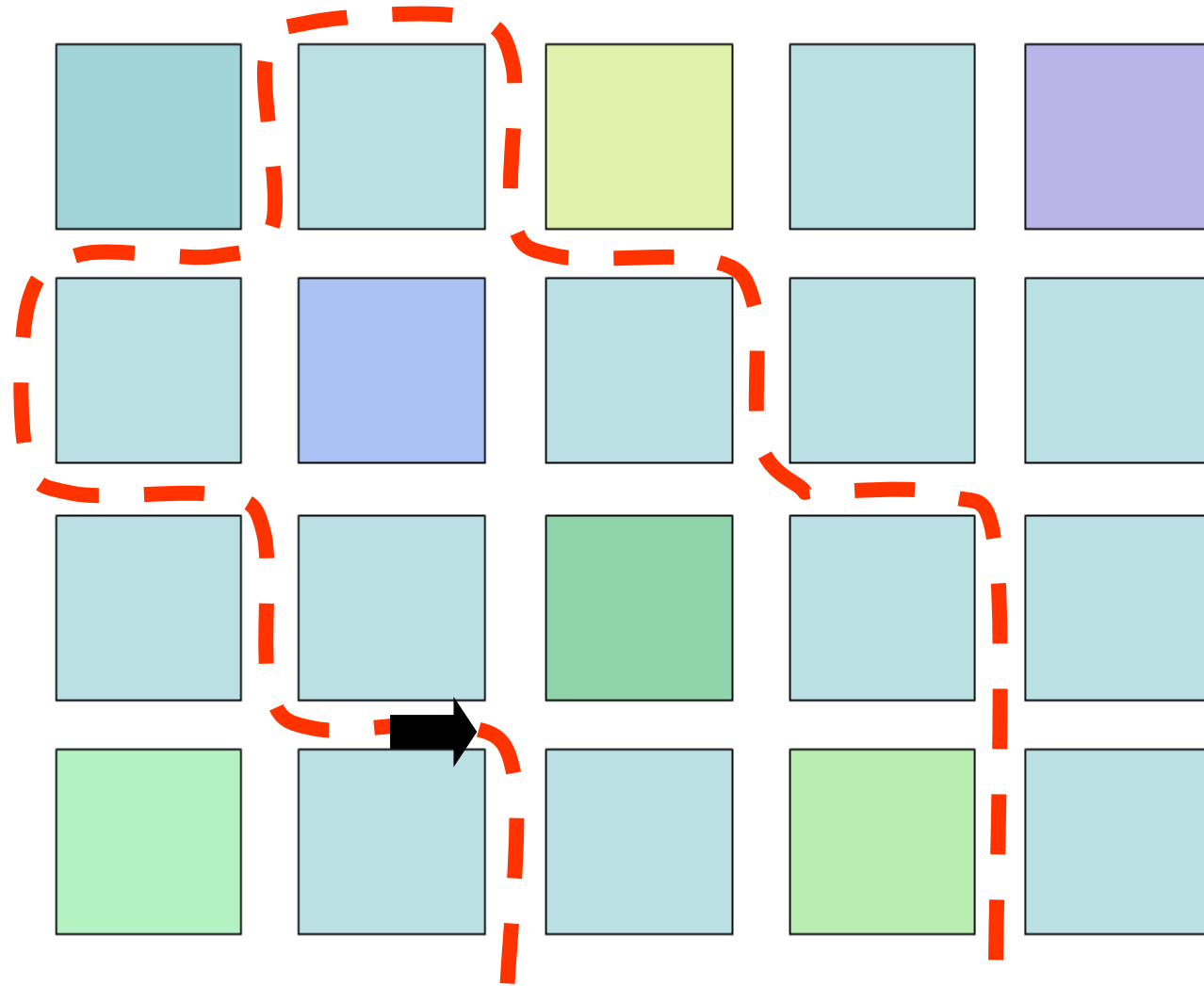


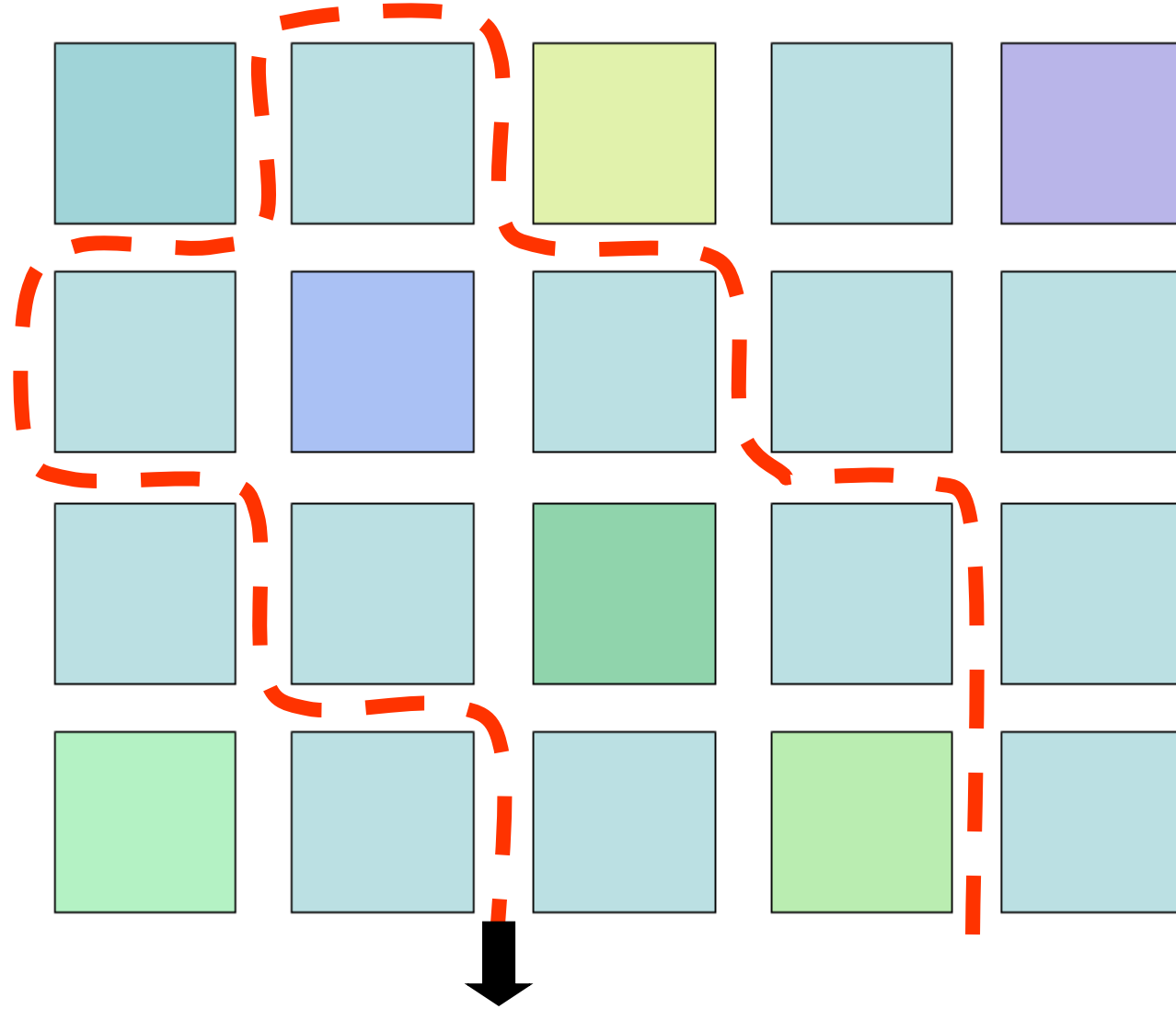


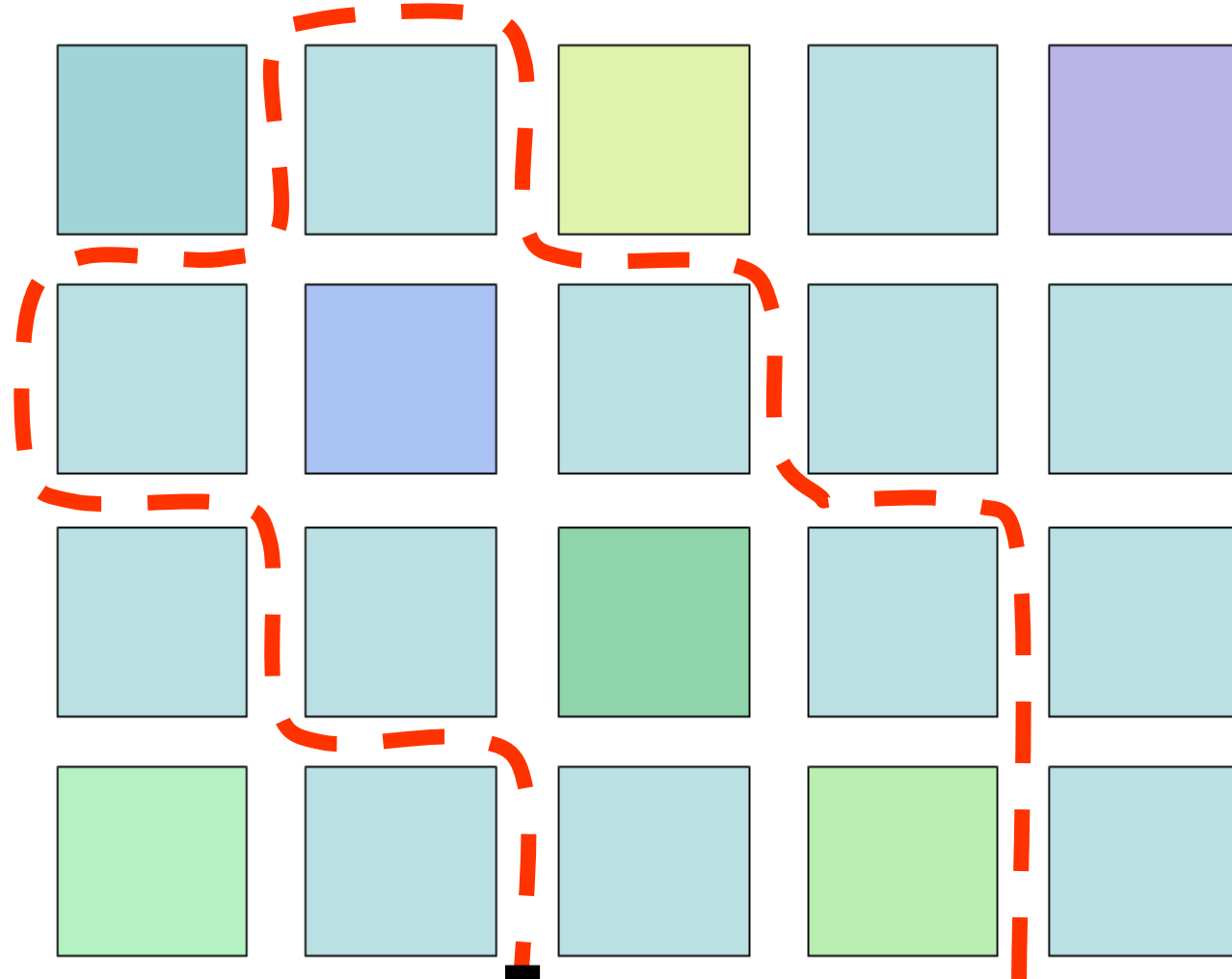




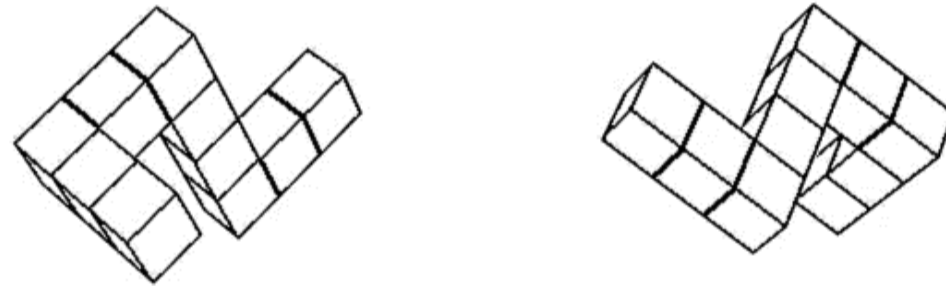




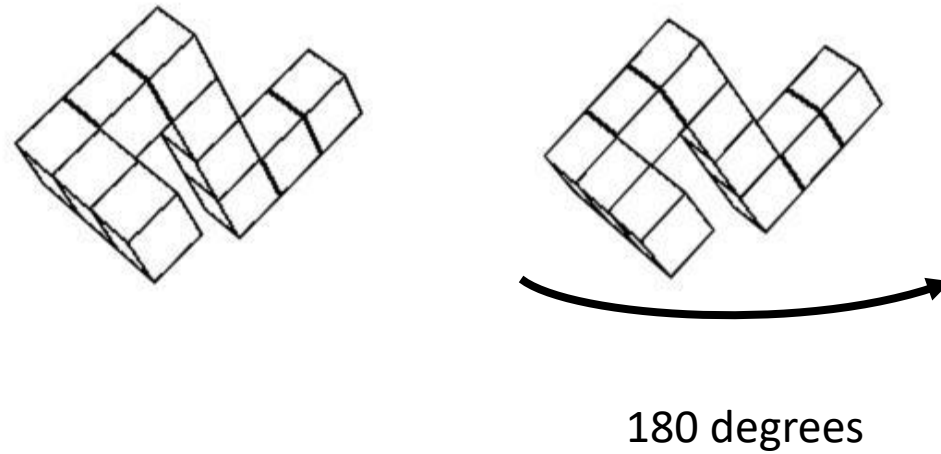




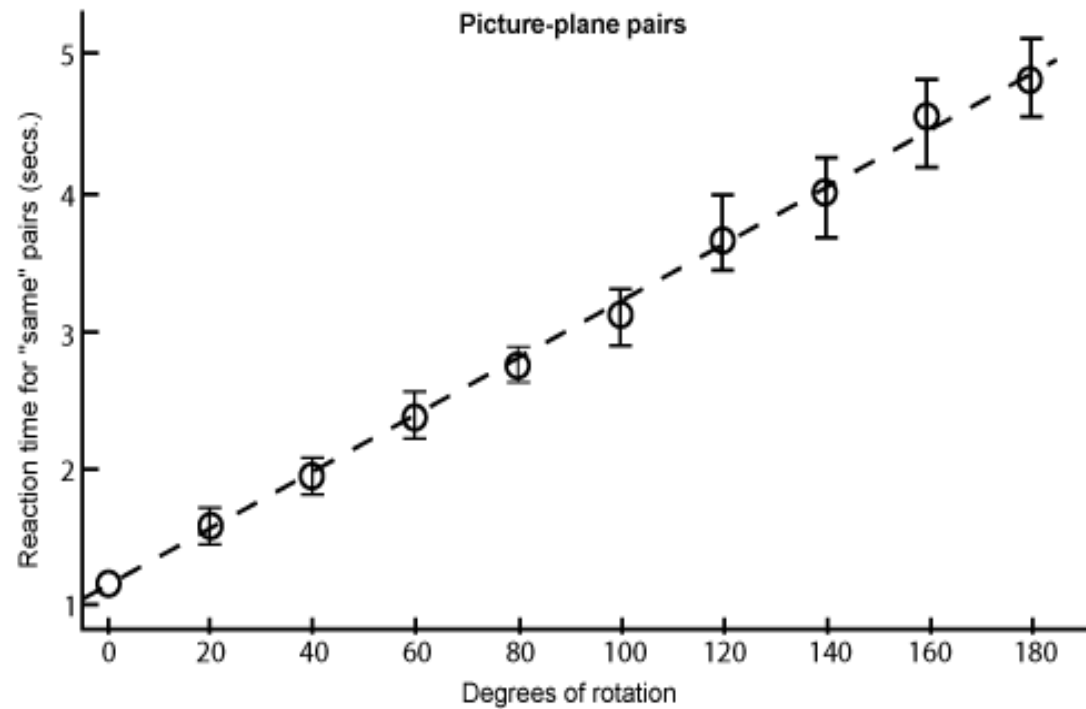
Denna kartorienterig kallas **Nord-upp**



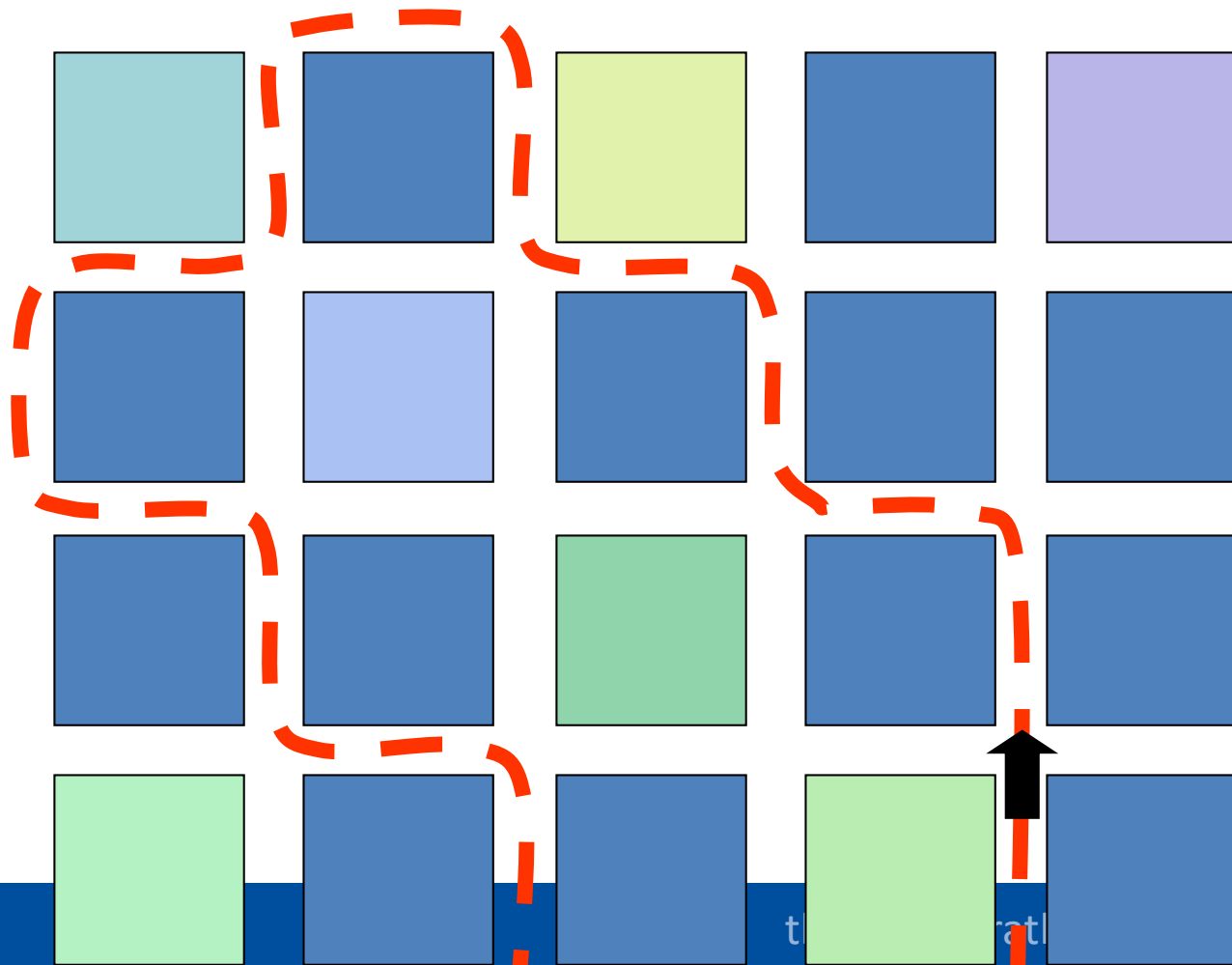
Shepard, R. N., & Metzler, J. (1971). Mental rotation of three-dimensional objects. *Science*, 171, 701-703.



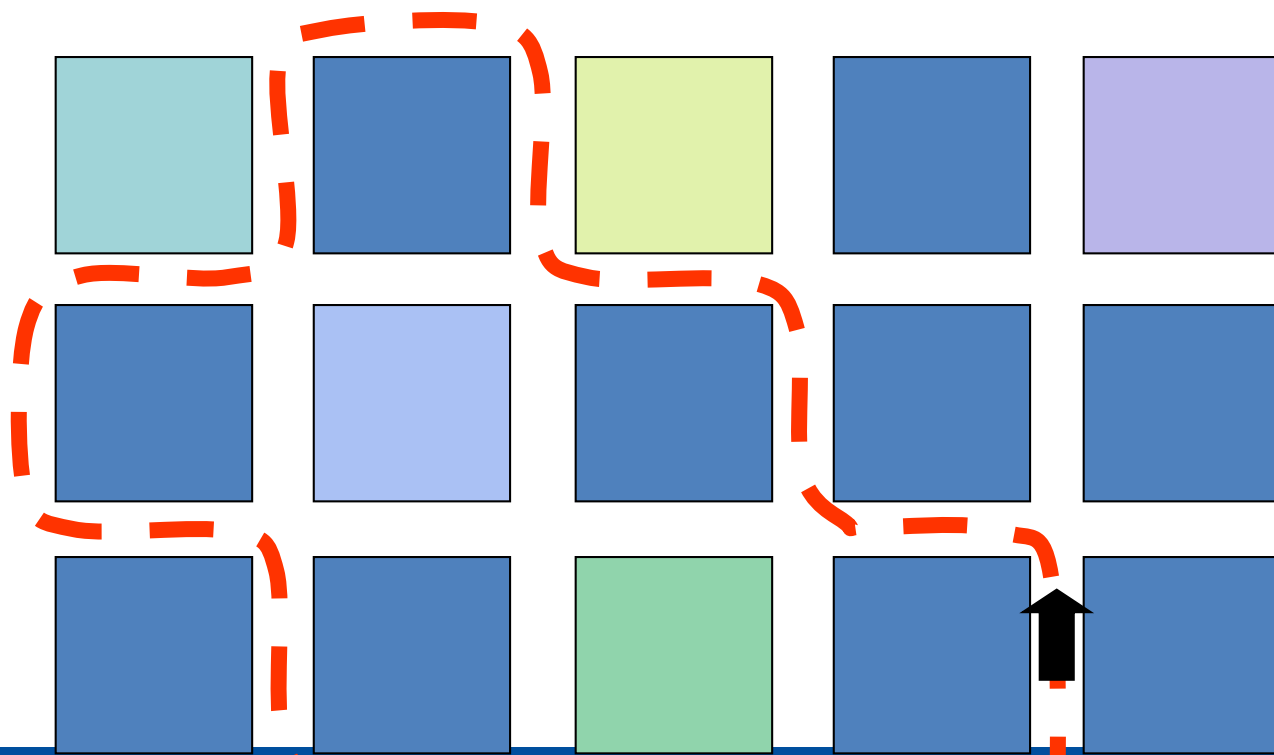
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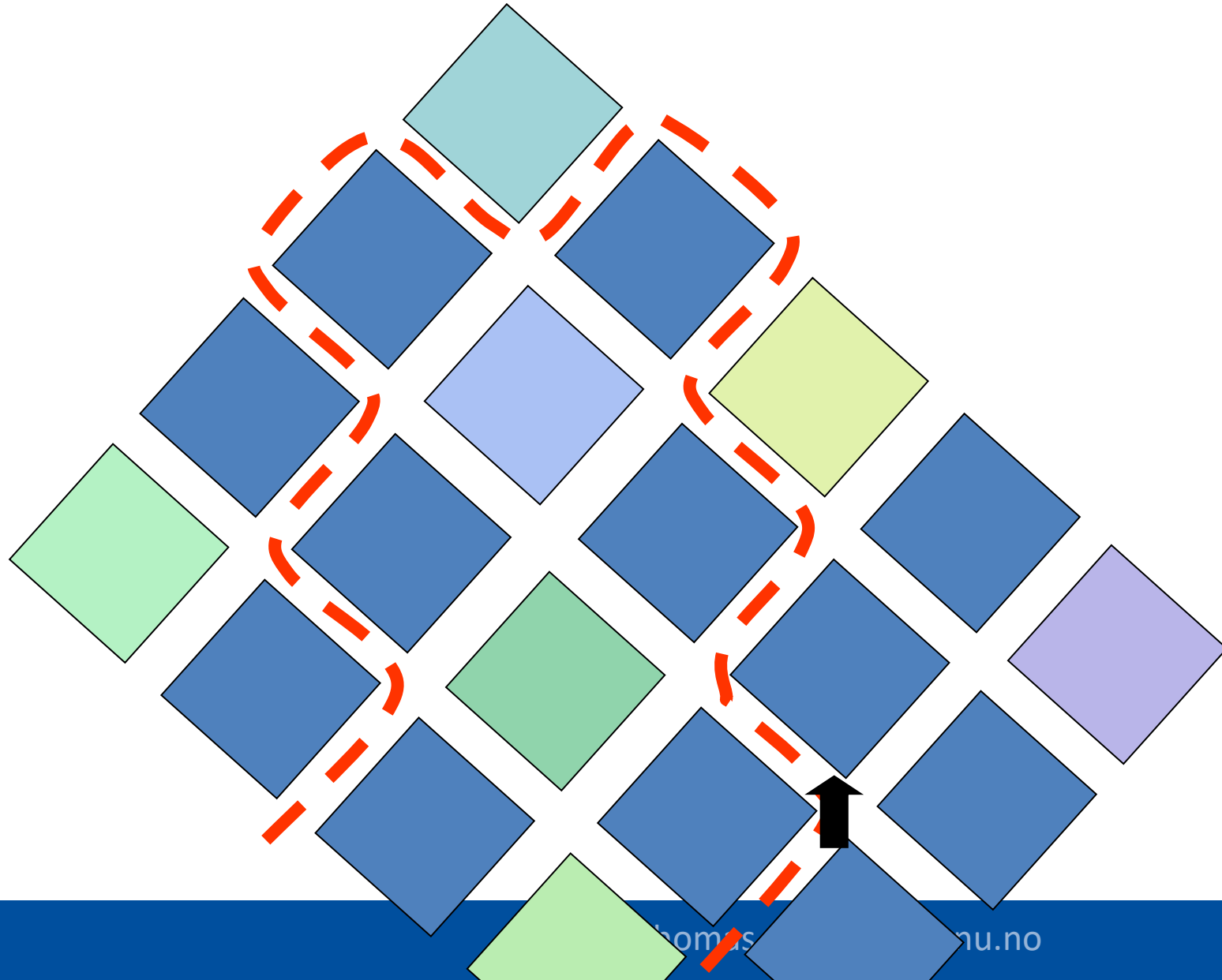
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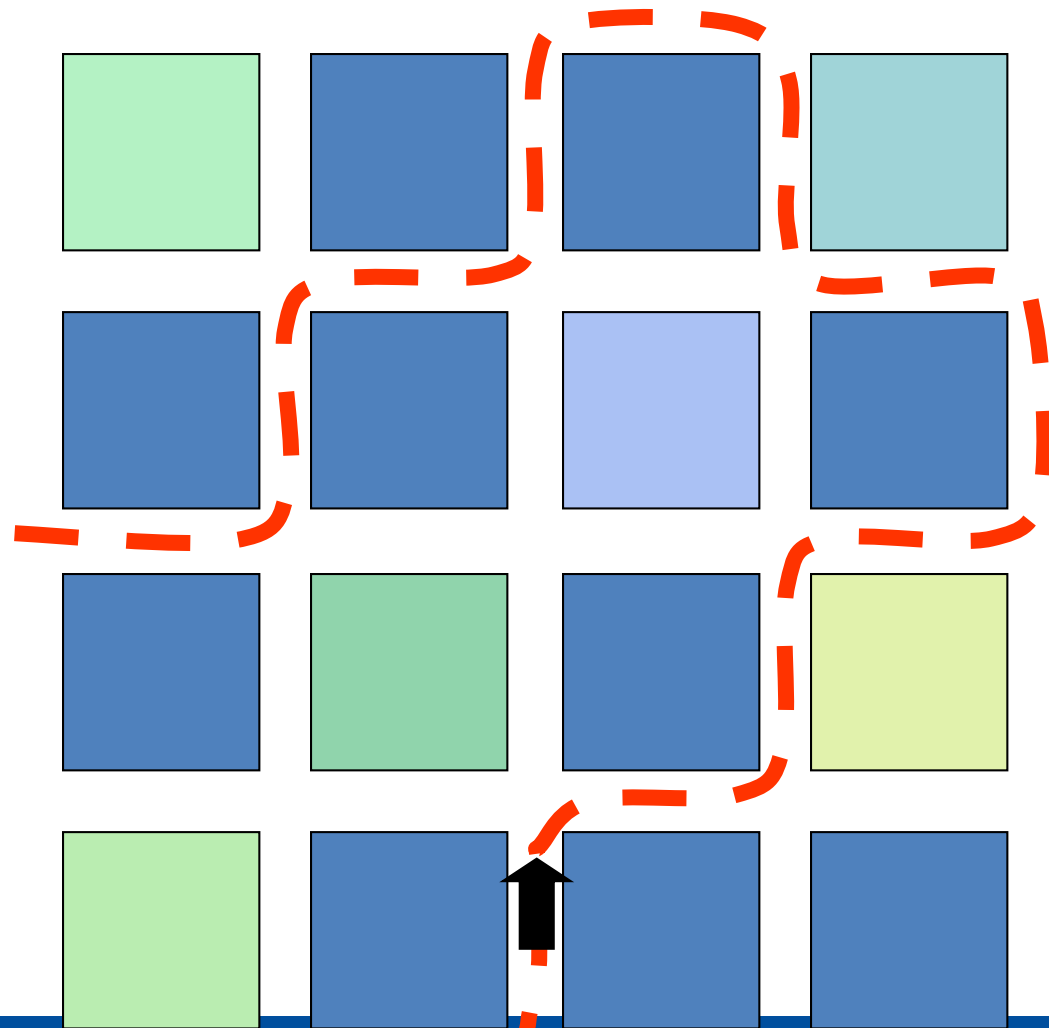


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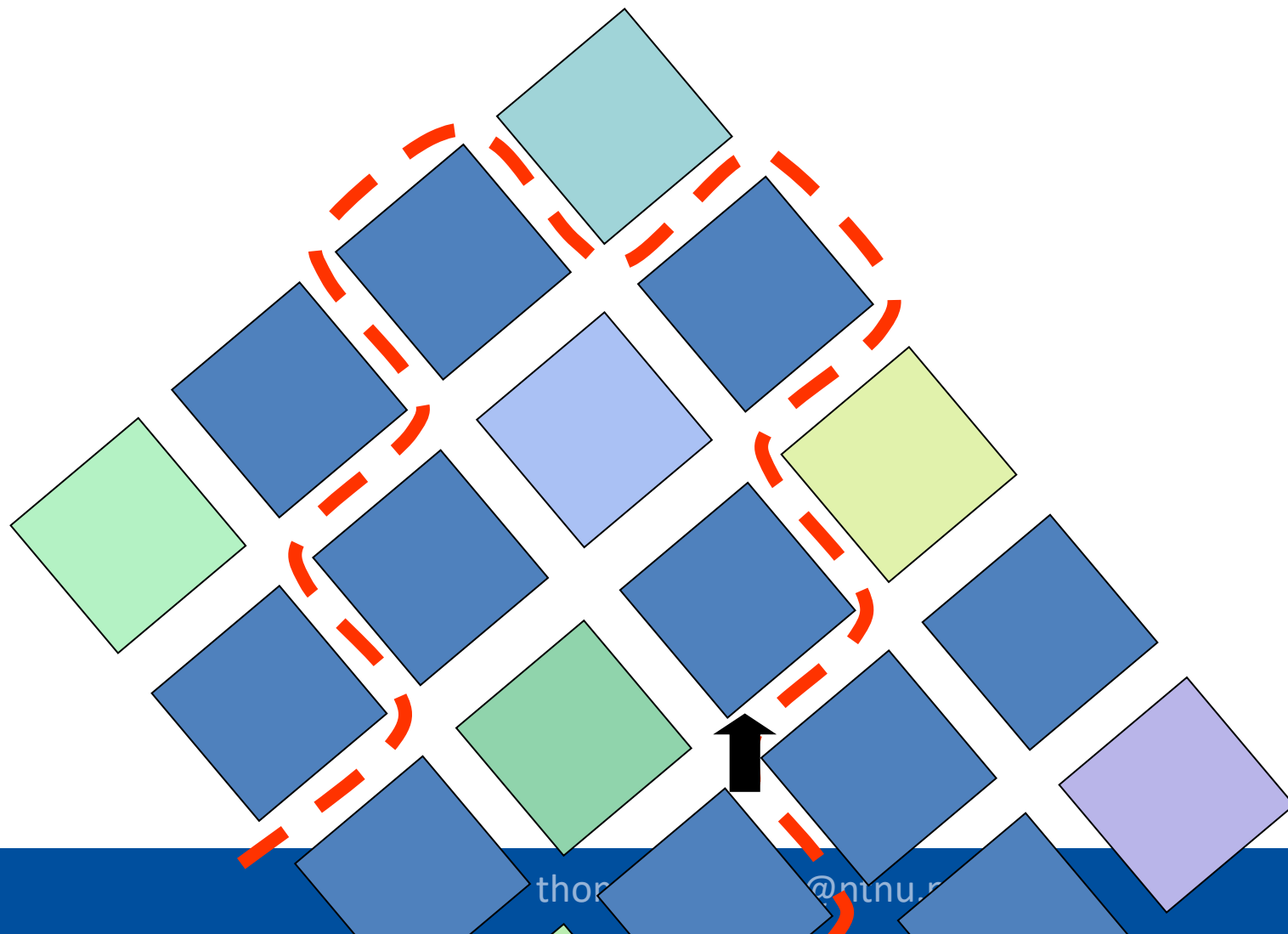


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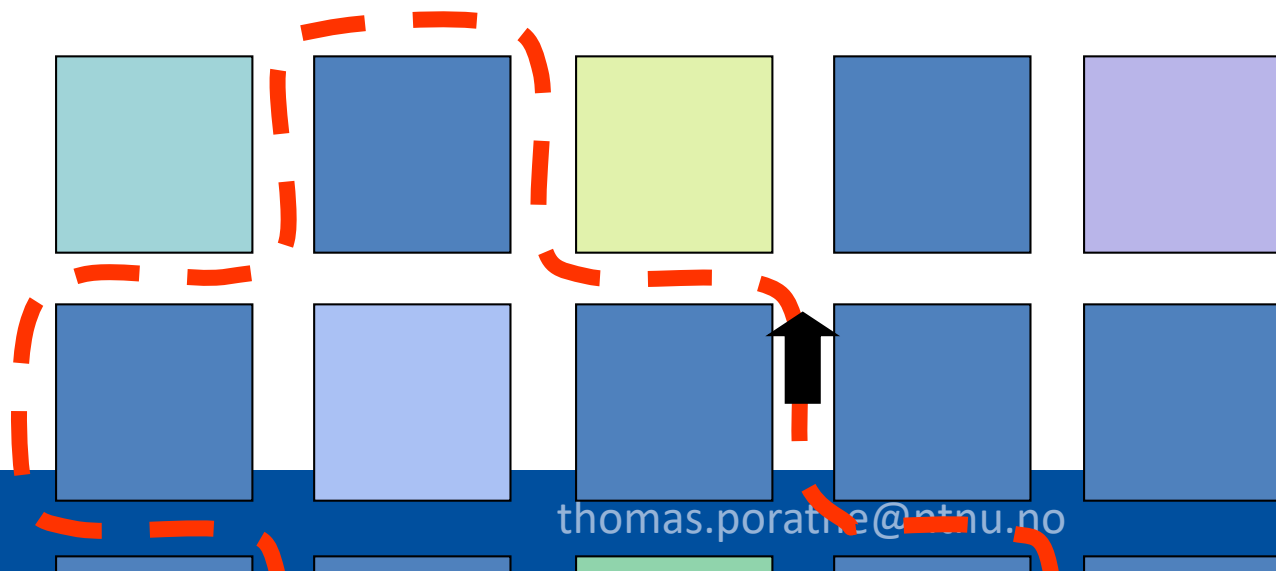




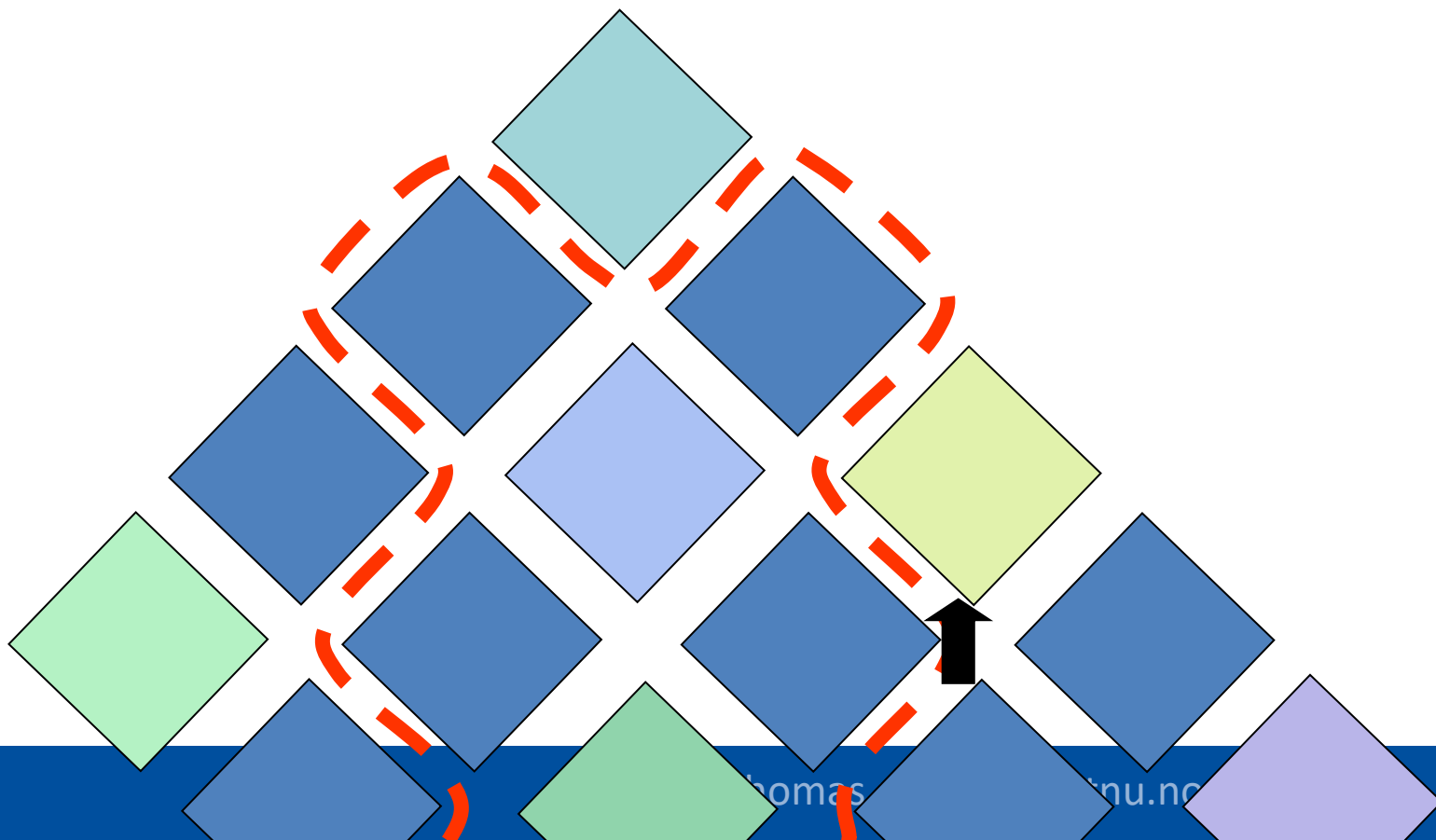
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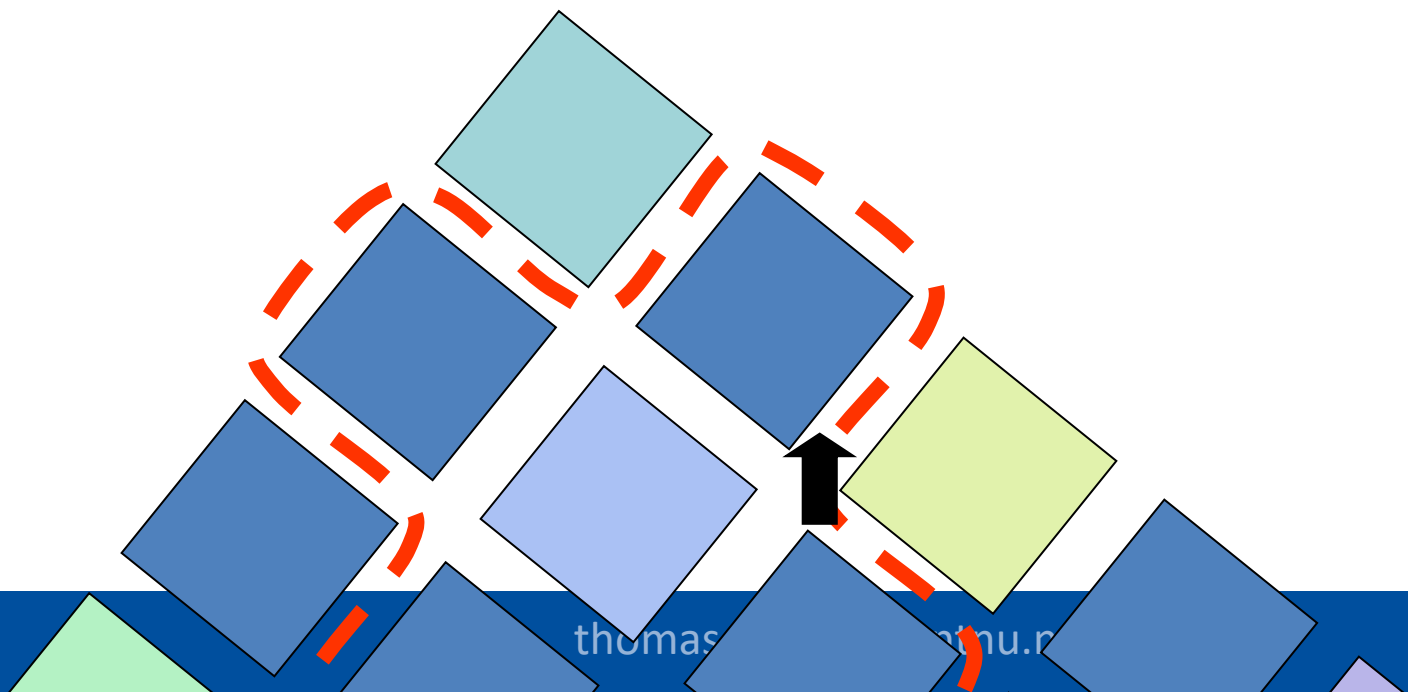


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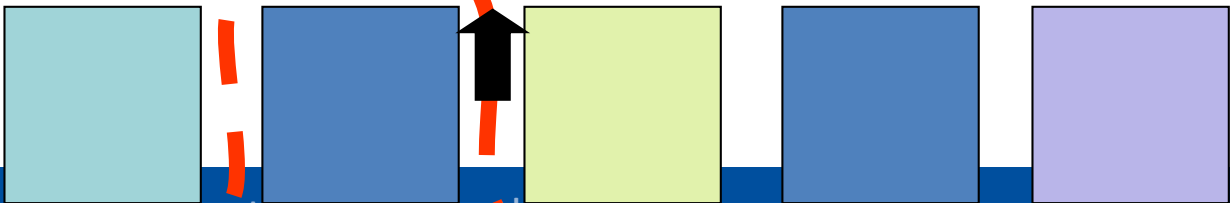


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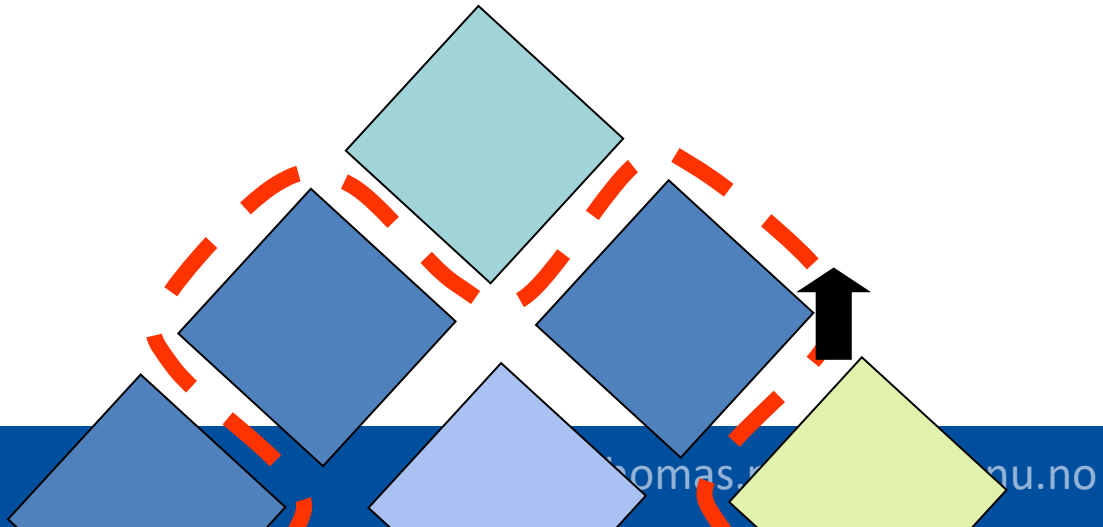




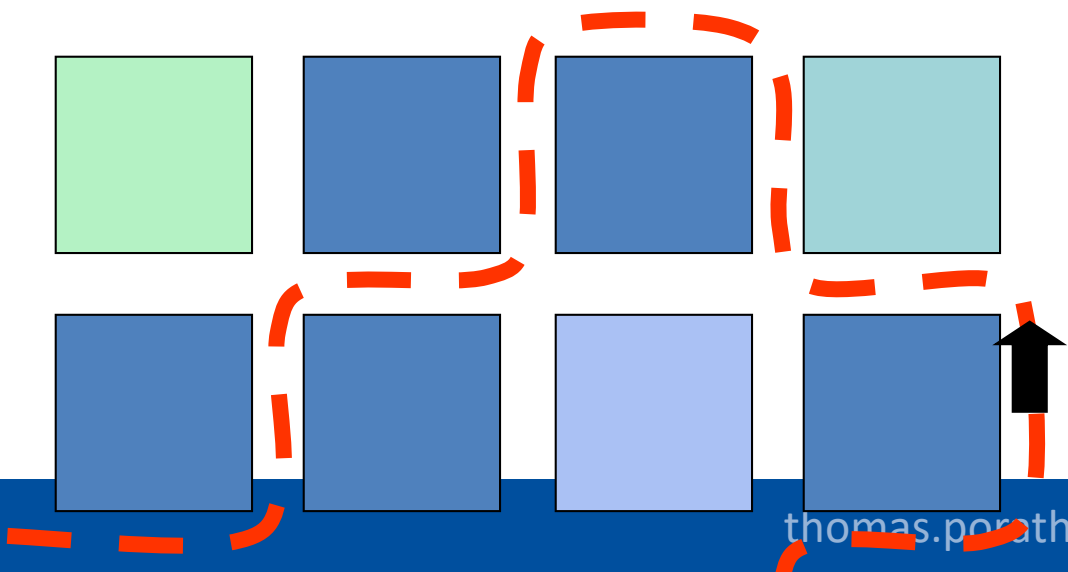
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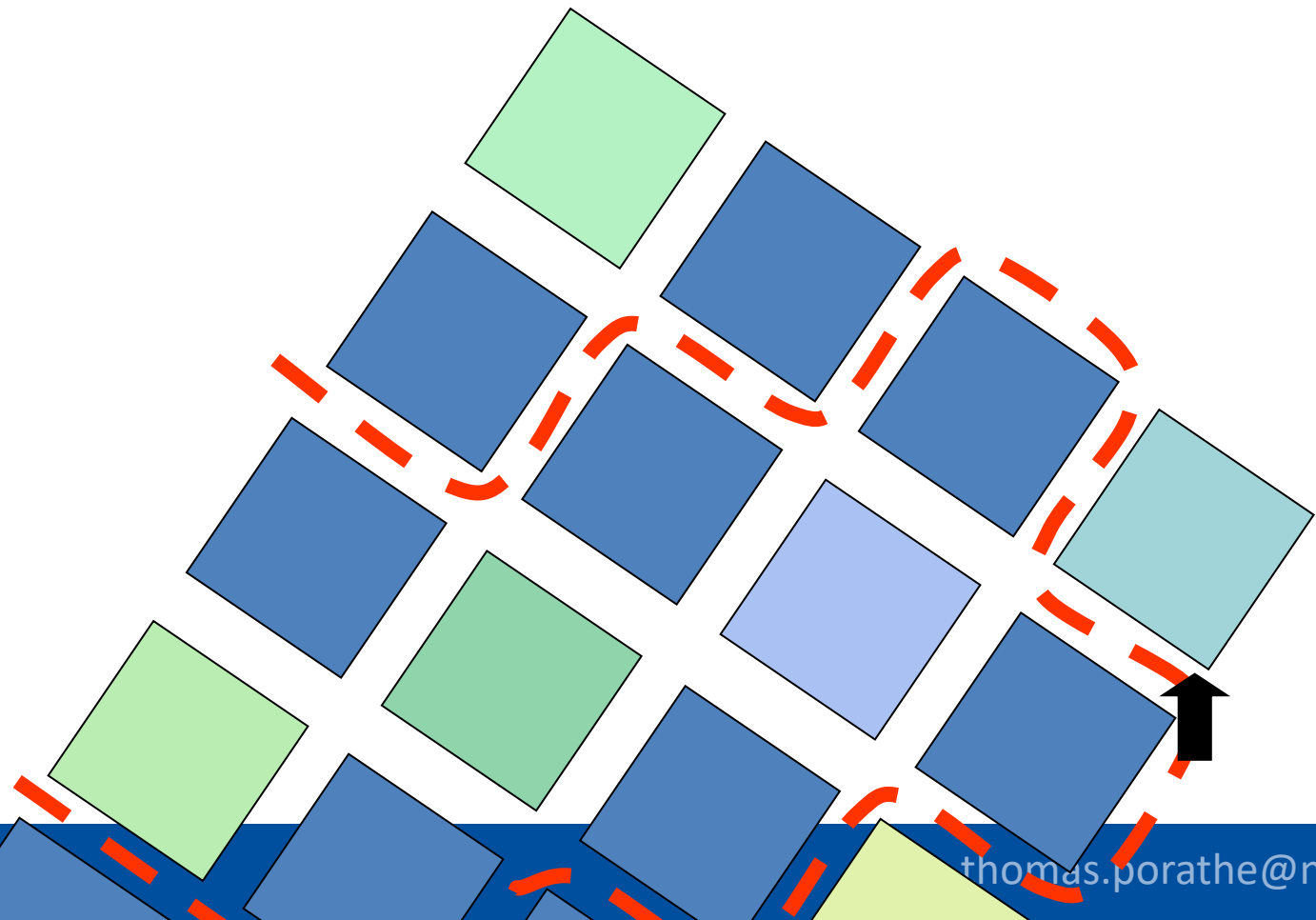
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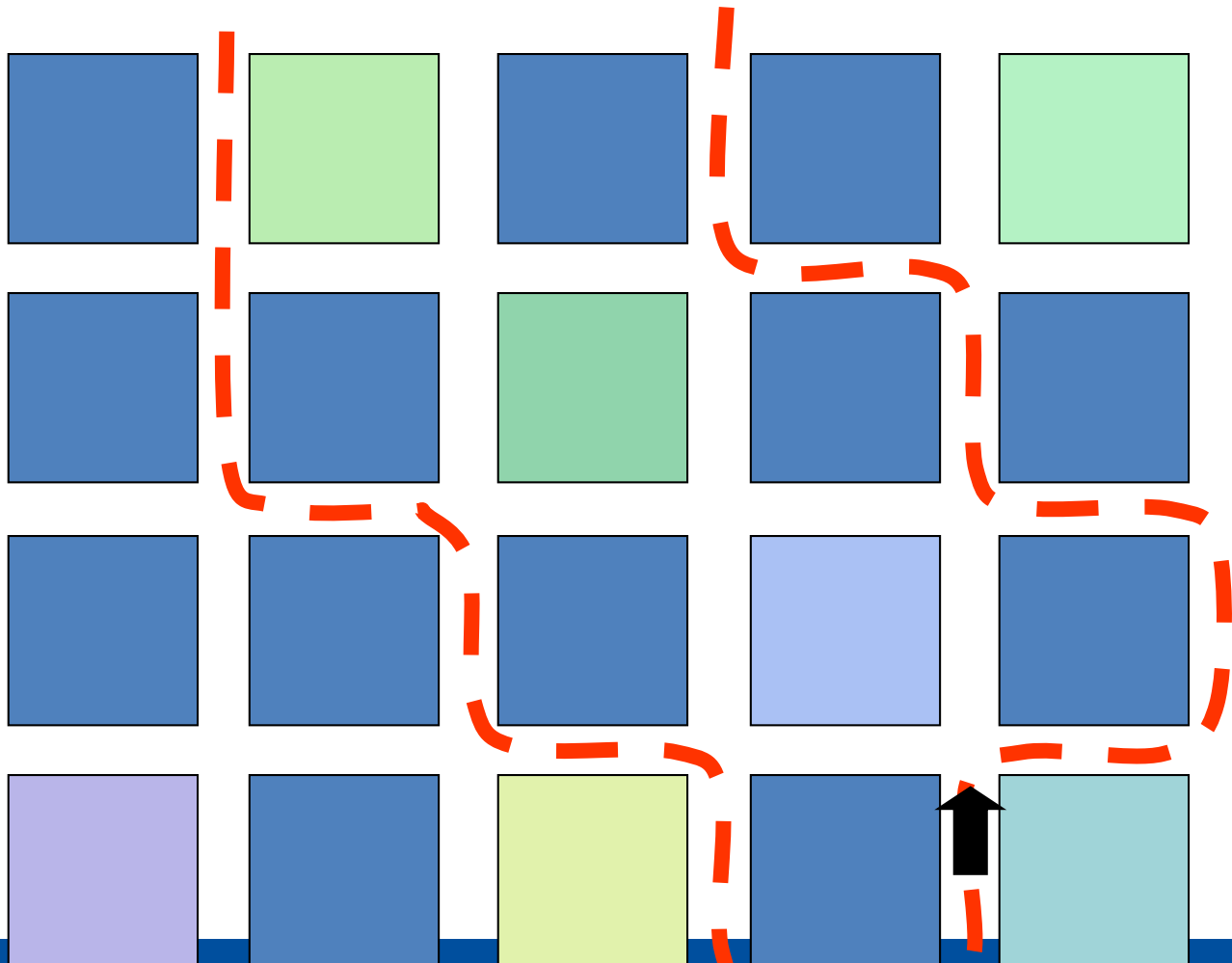
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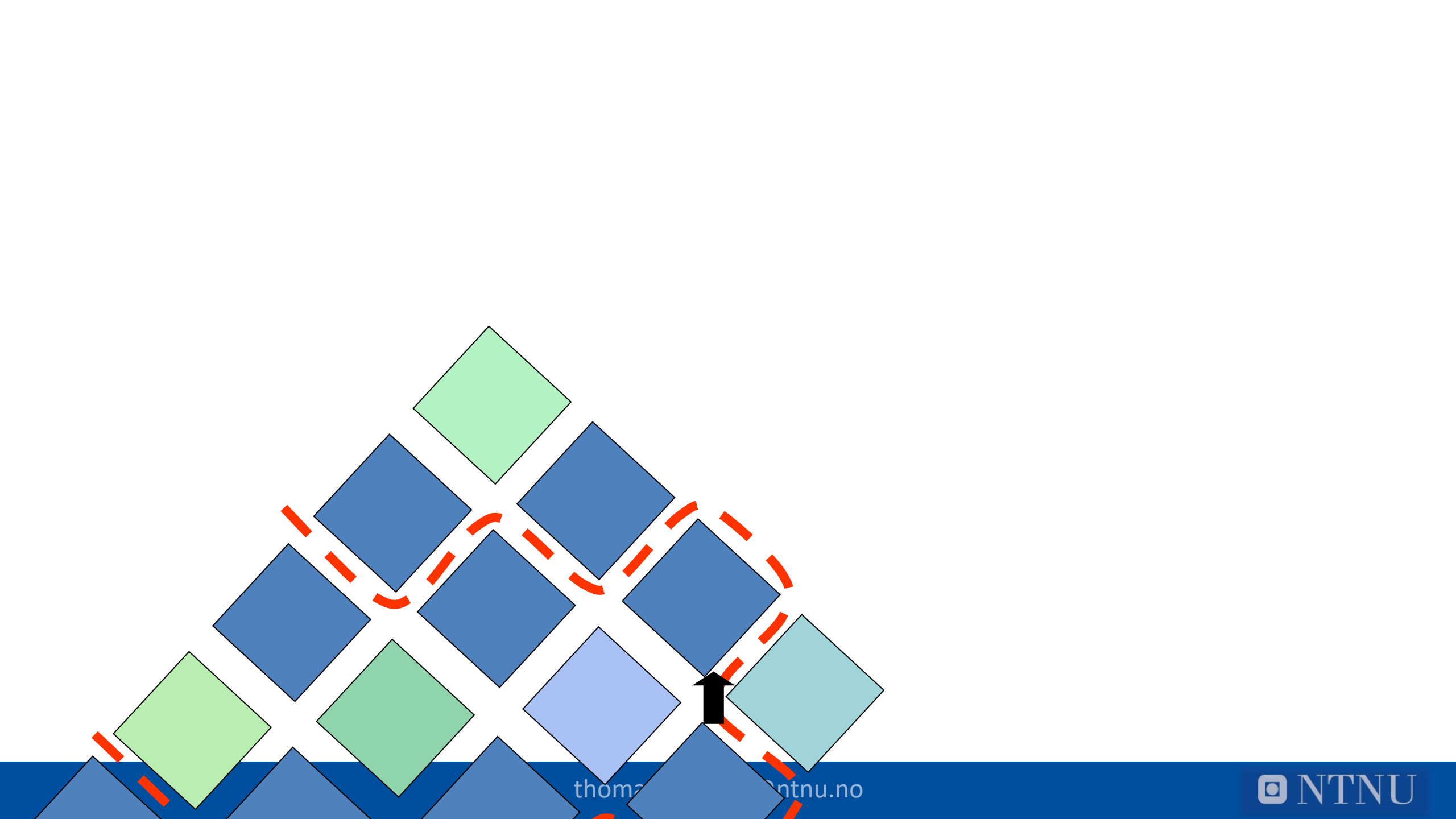


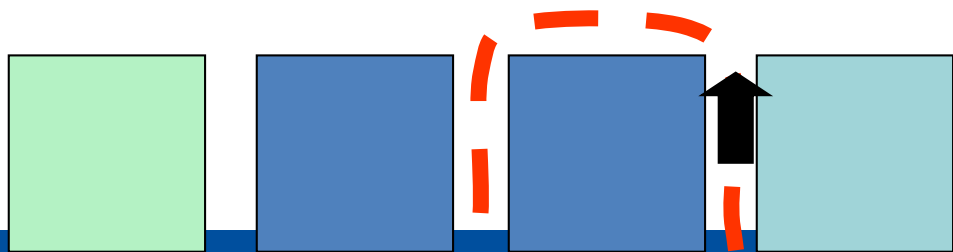
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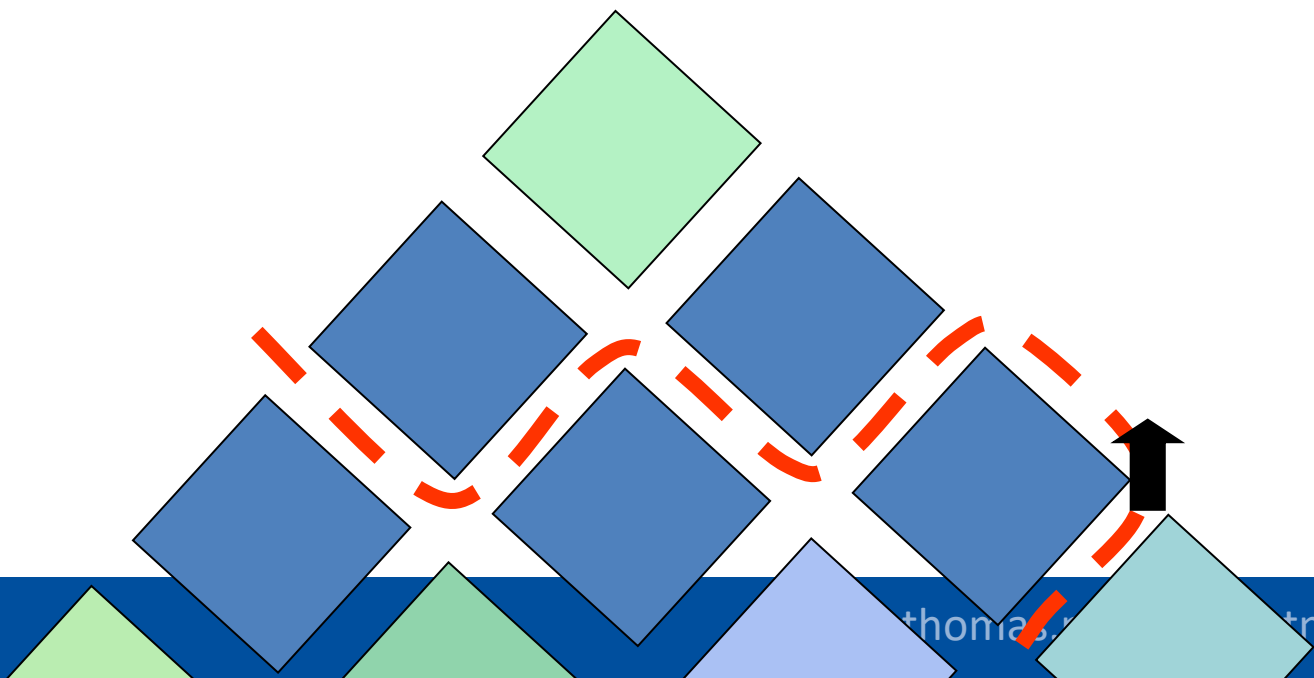
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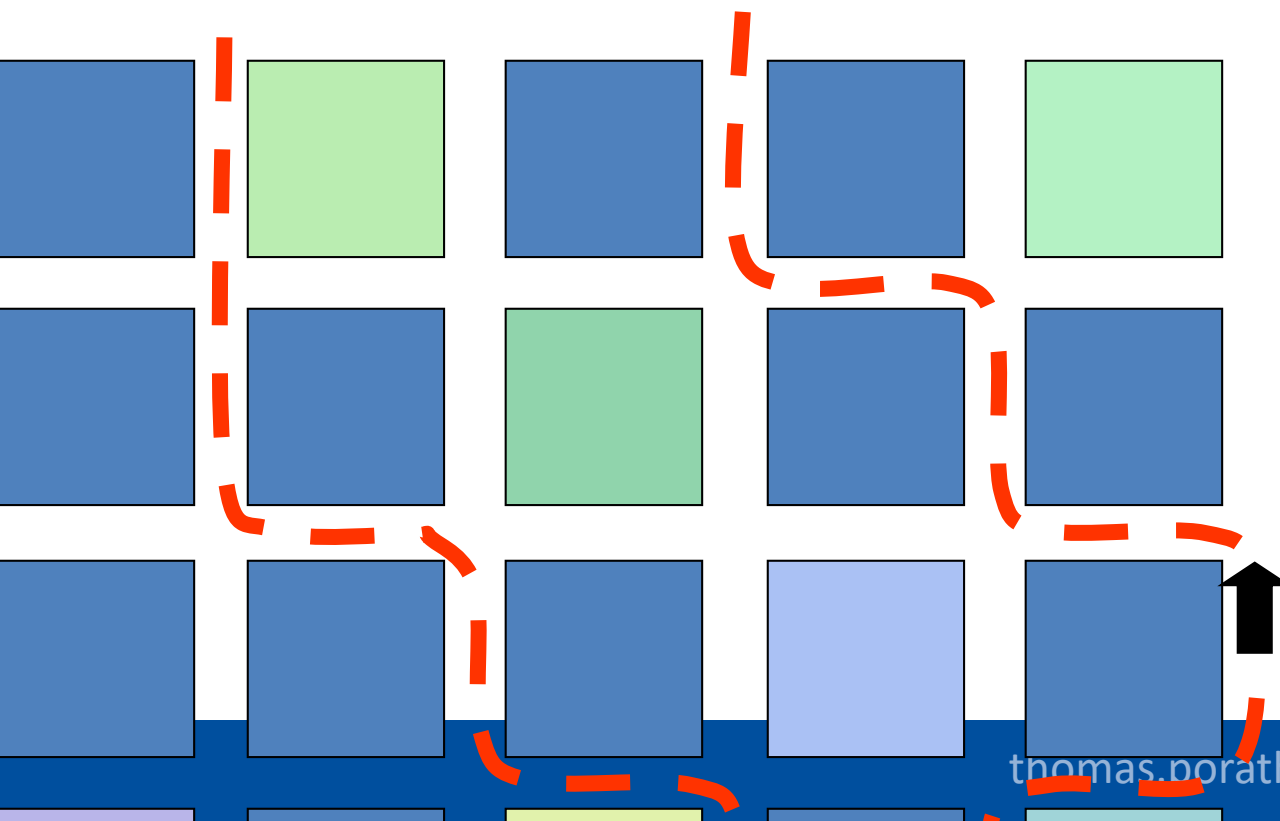




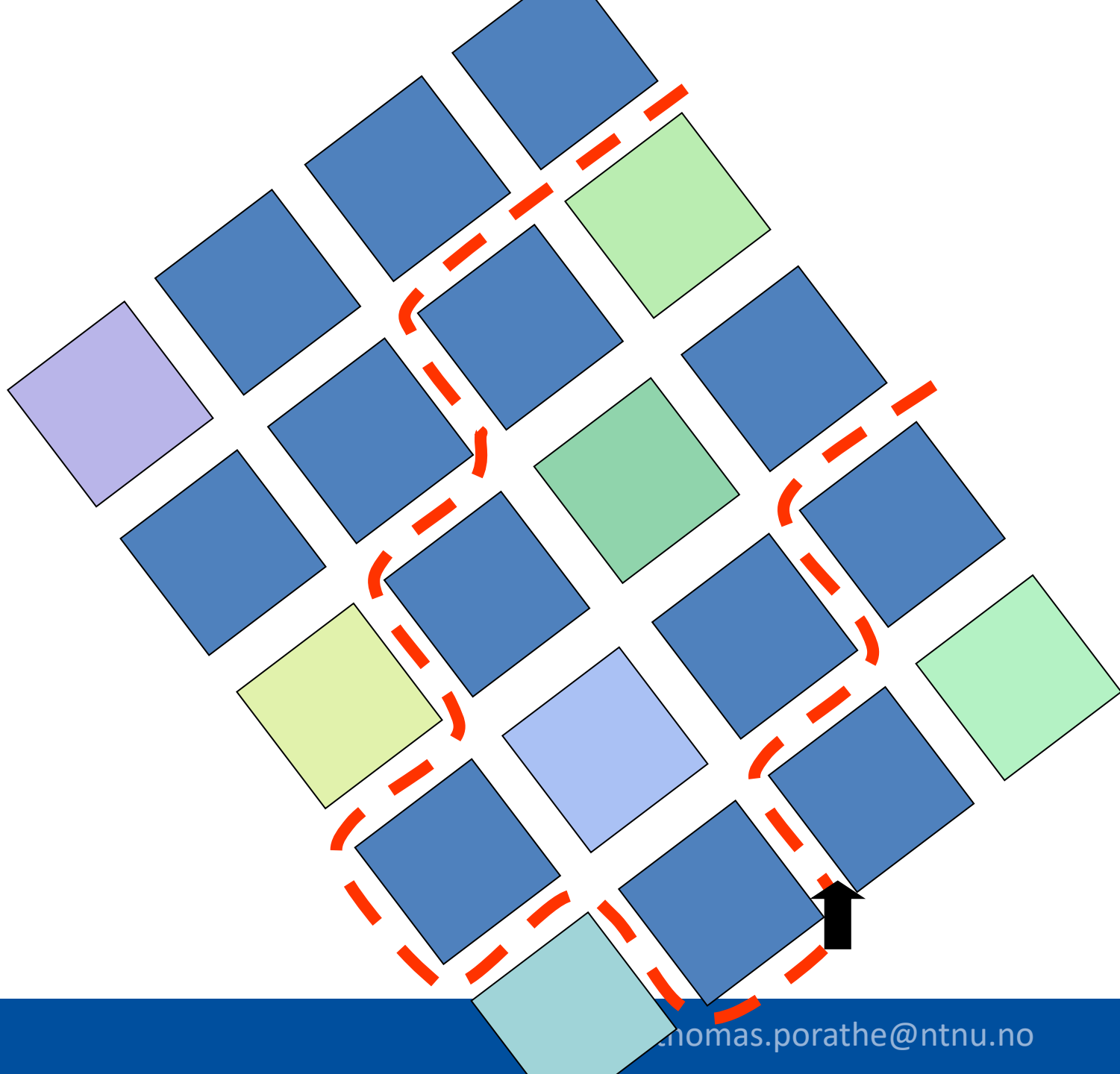
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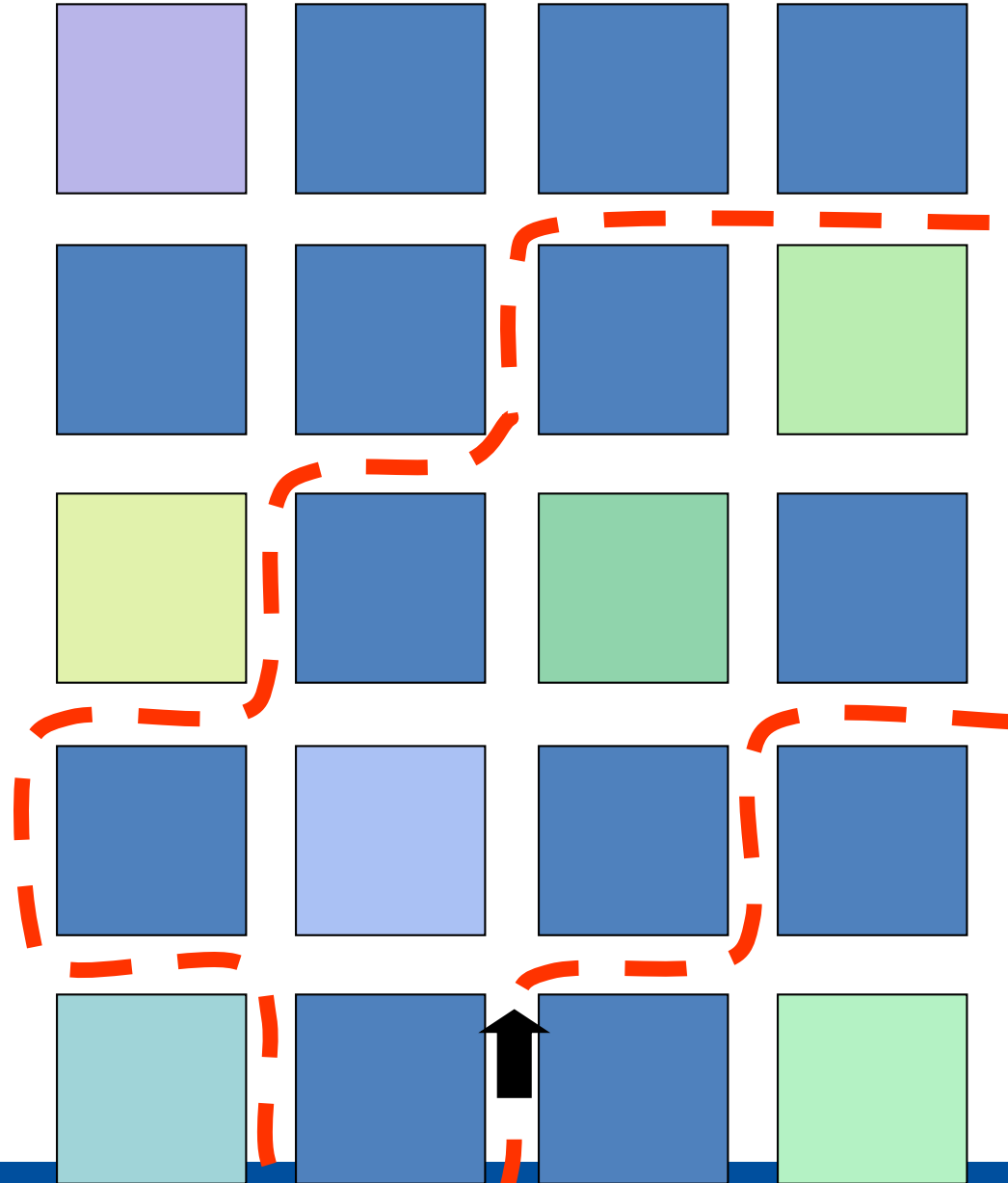


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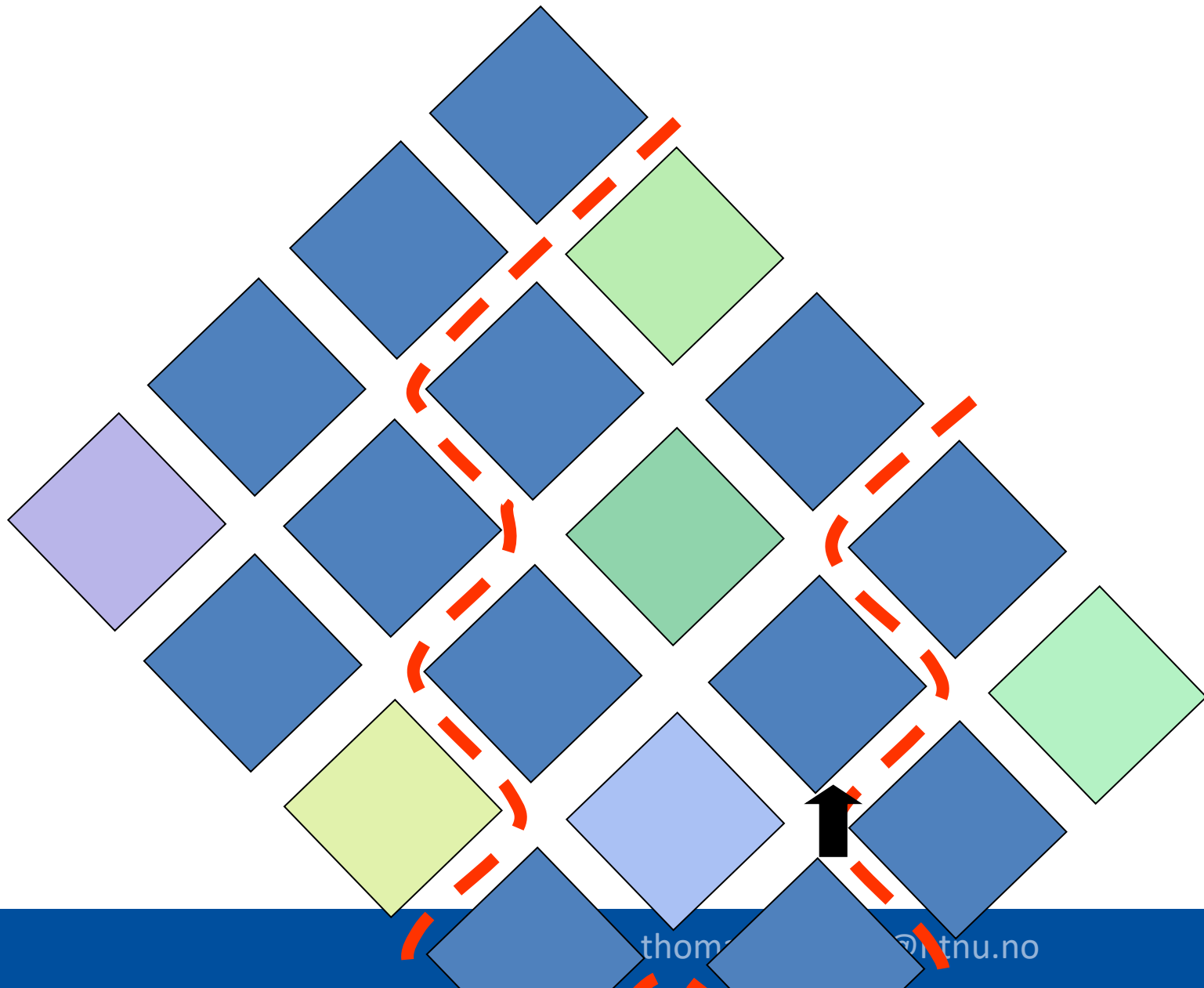


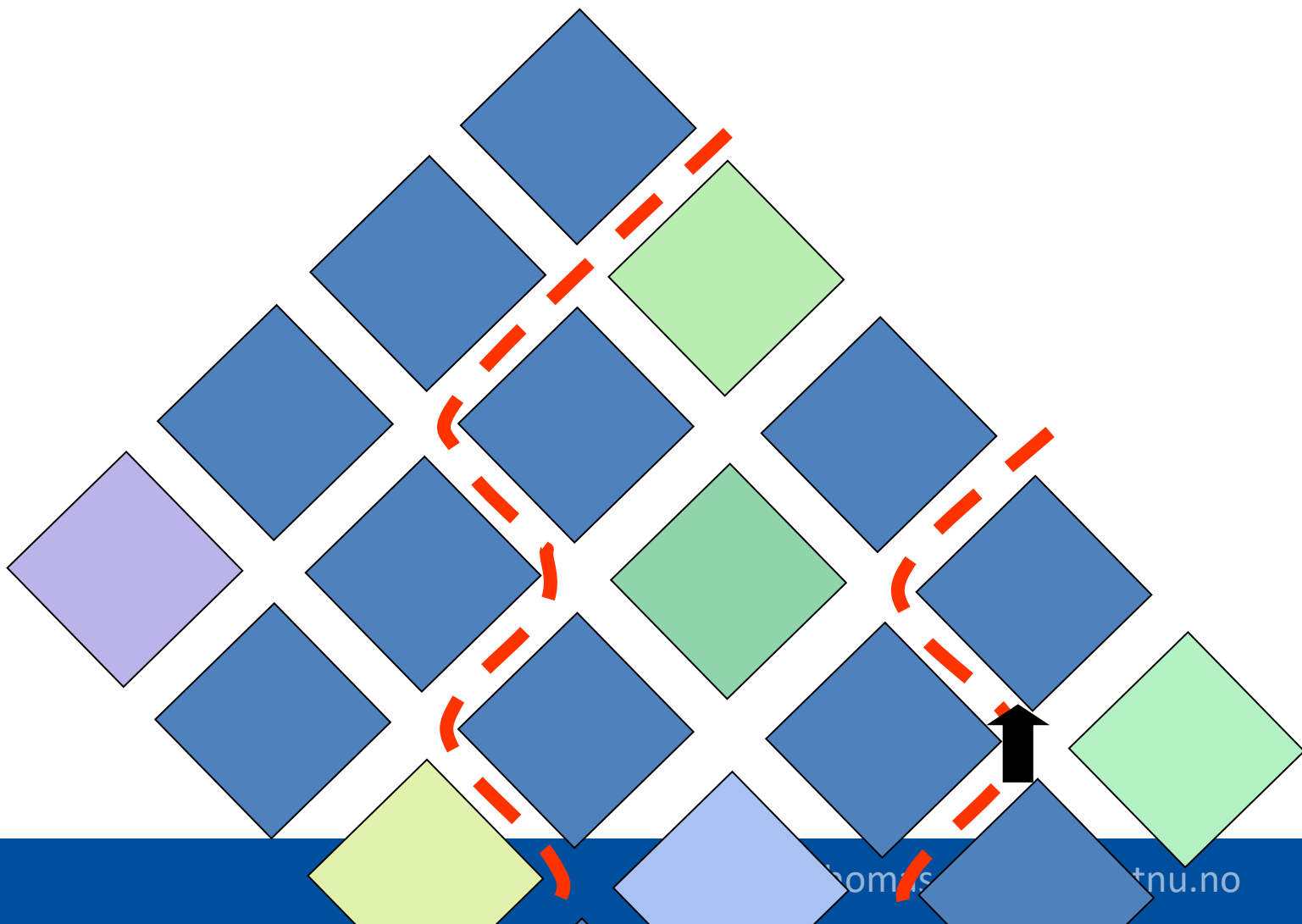
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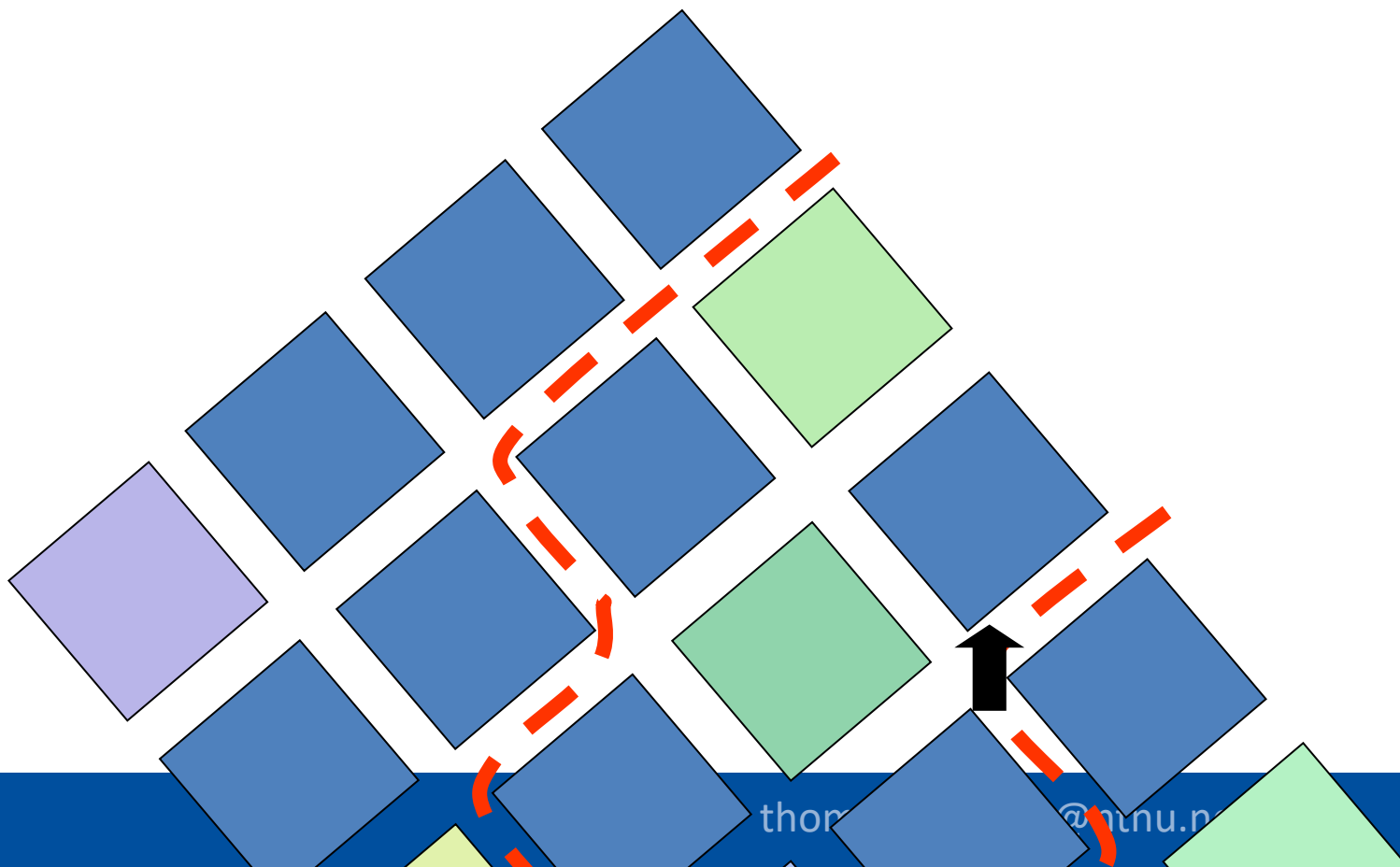




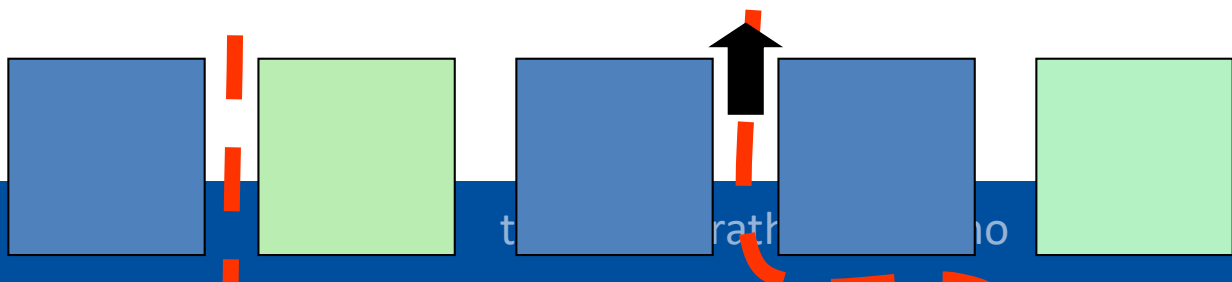
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Denna kartorientering kallas

Head -up





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PÅ GRUND AV ...? Marinen kunde i går inte ge svar på vilken hastighet stridsbåt 90 Helge hade när den rände upp på Stora Brunn. 20 värnpliktiga ombord klarade sig, de tre besättningsmännen fördes till sjukhus med lättare skador.

Bild: BENGT C

Militärbåt rände upp på land

MARSTRAND: Besättningen fick lättare skador men övriga 20 ombord klarade sig oskadda när stridsbåt 90 Helge ratten

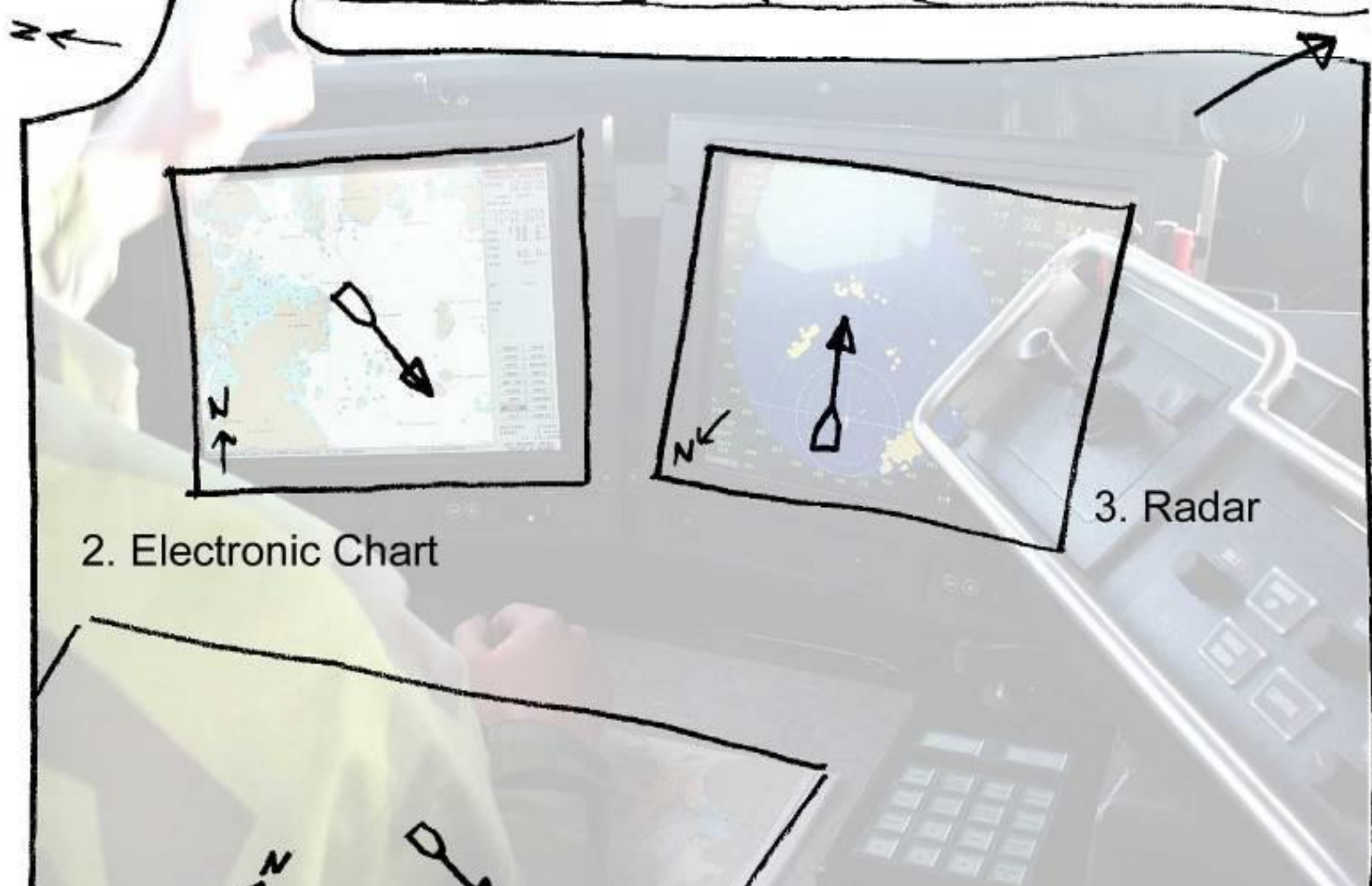
– Färddatorn på båten kommer att ge oss svaren på hur fort man körde, om det är något fel på båten eller om det finns andra orsaker till olyckan, säger överstelöjtnant Ro-

hus. Väl tillbaka på Amf 4 i Göteborg fick de i första hand träffa en krisgrupp.

– Besättningen kommer också att intervjuas för att vi ska få

– Den första besiktningen gjorts av båten visar att den har i skrovet och att en av motorens lossnat men vi har inte orsakat utsläpp av miljöfarliga ämnen

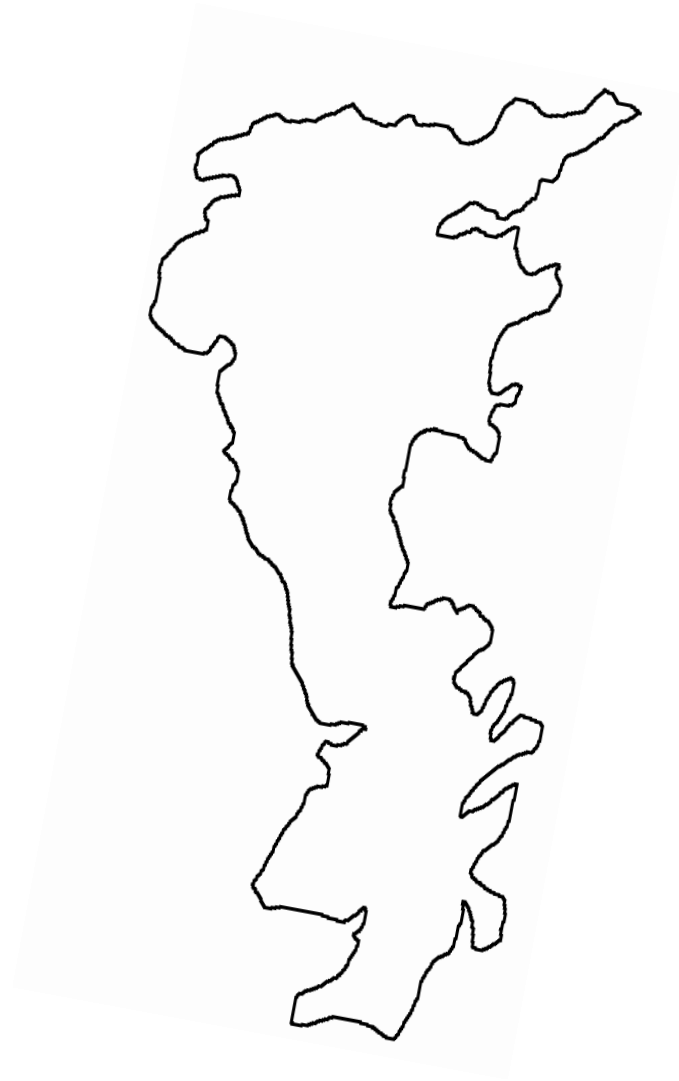


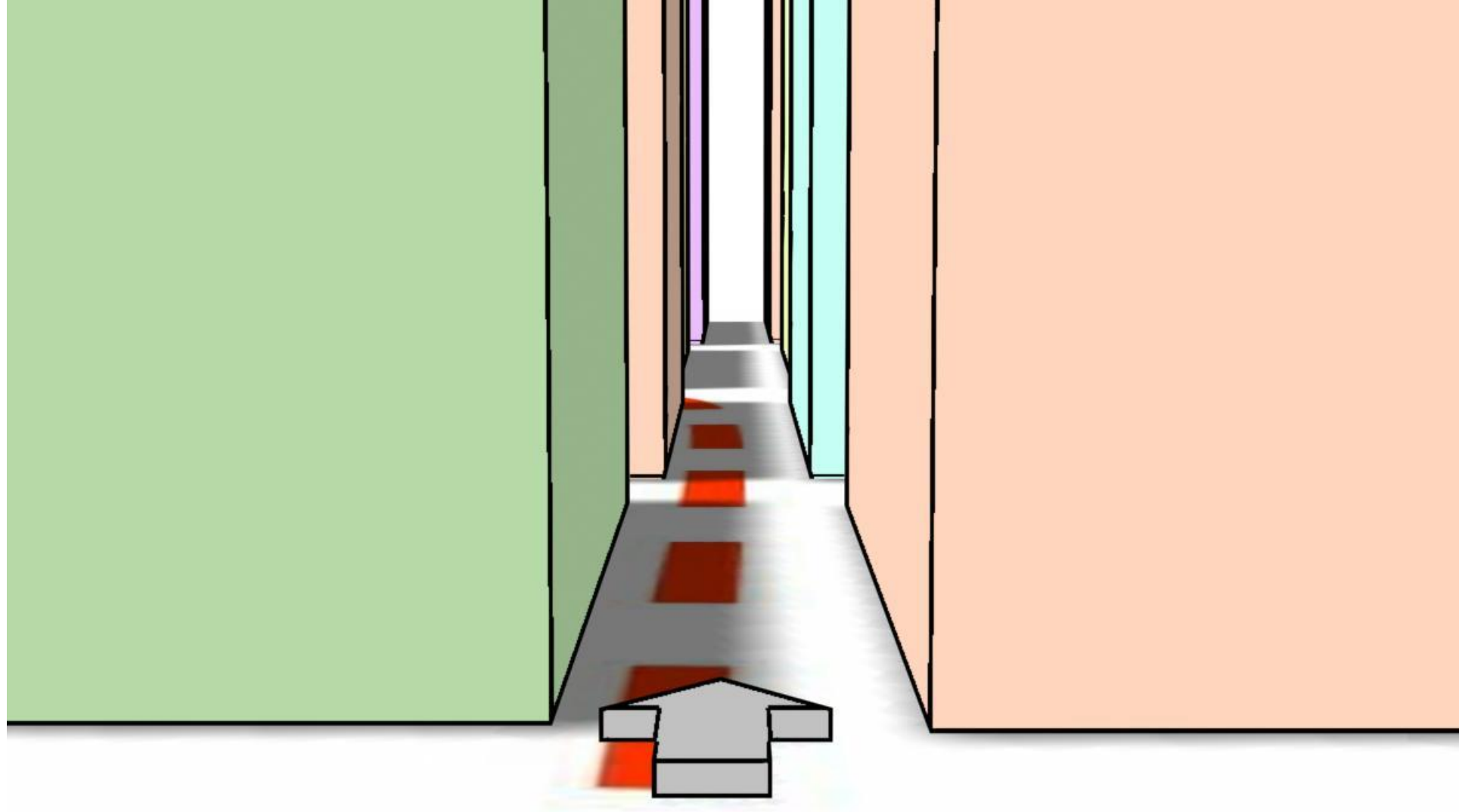


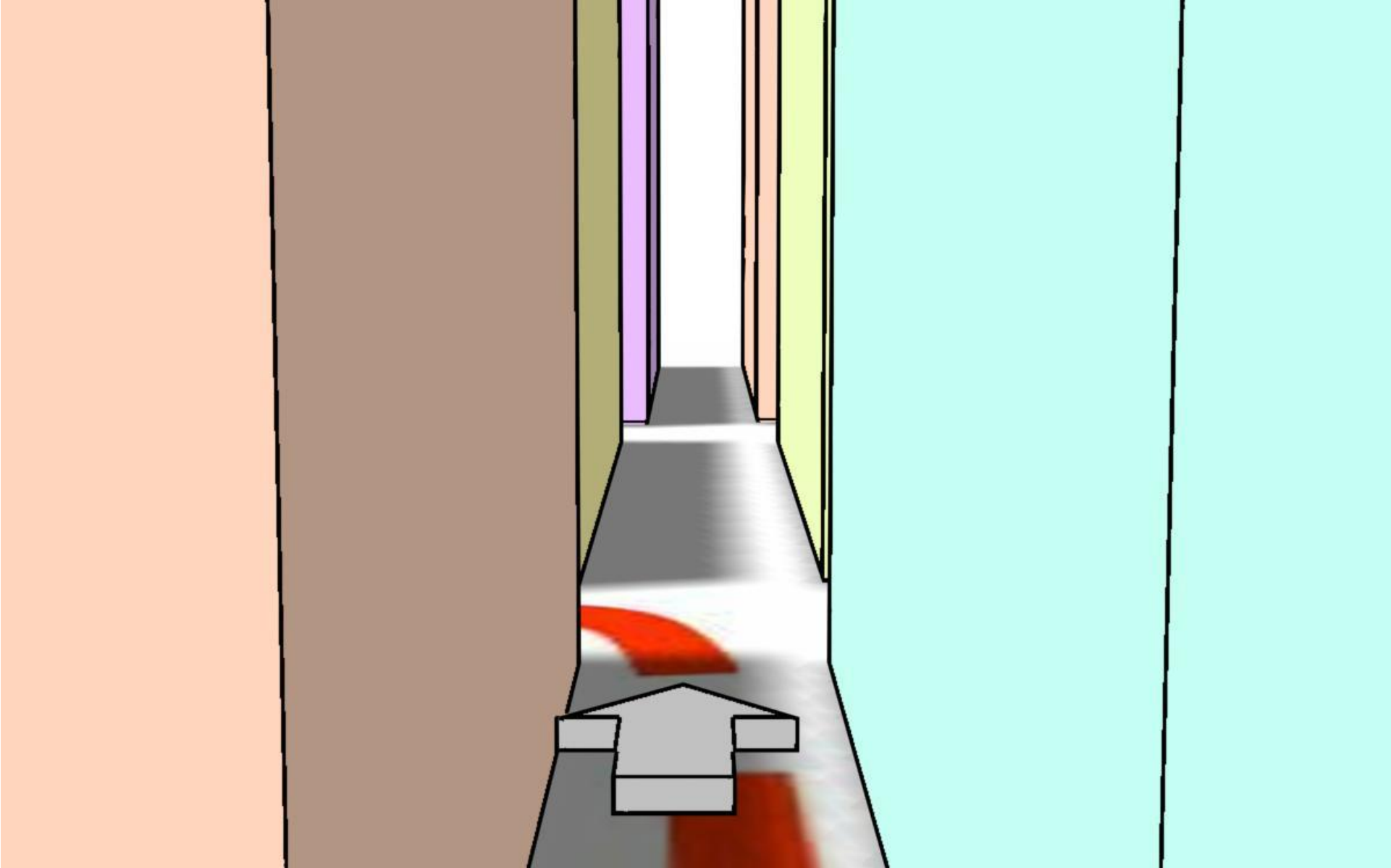
2. Electronic Chart

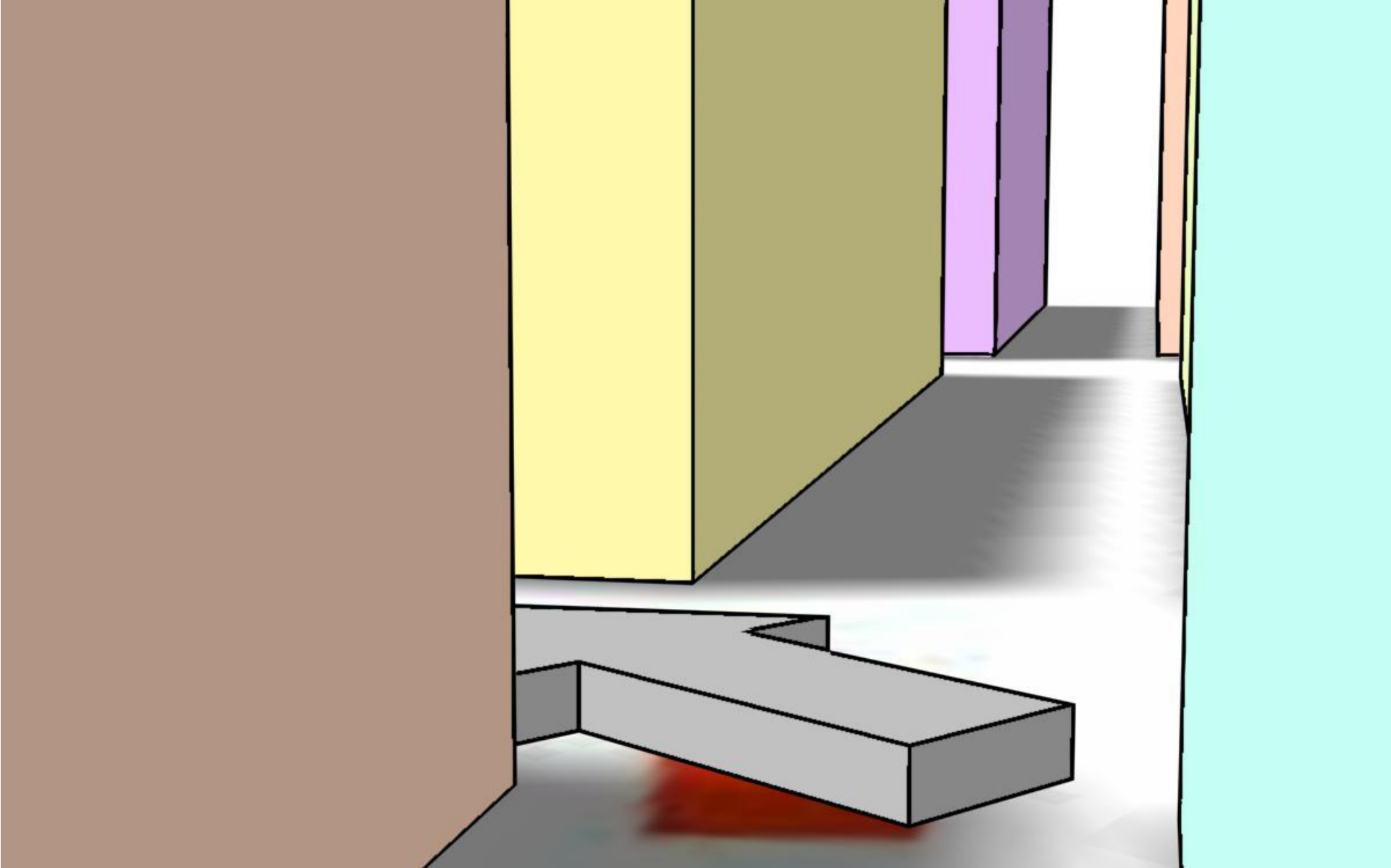
3. Radar

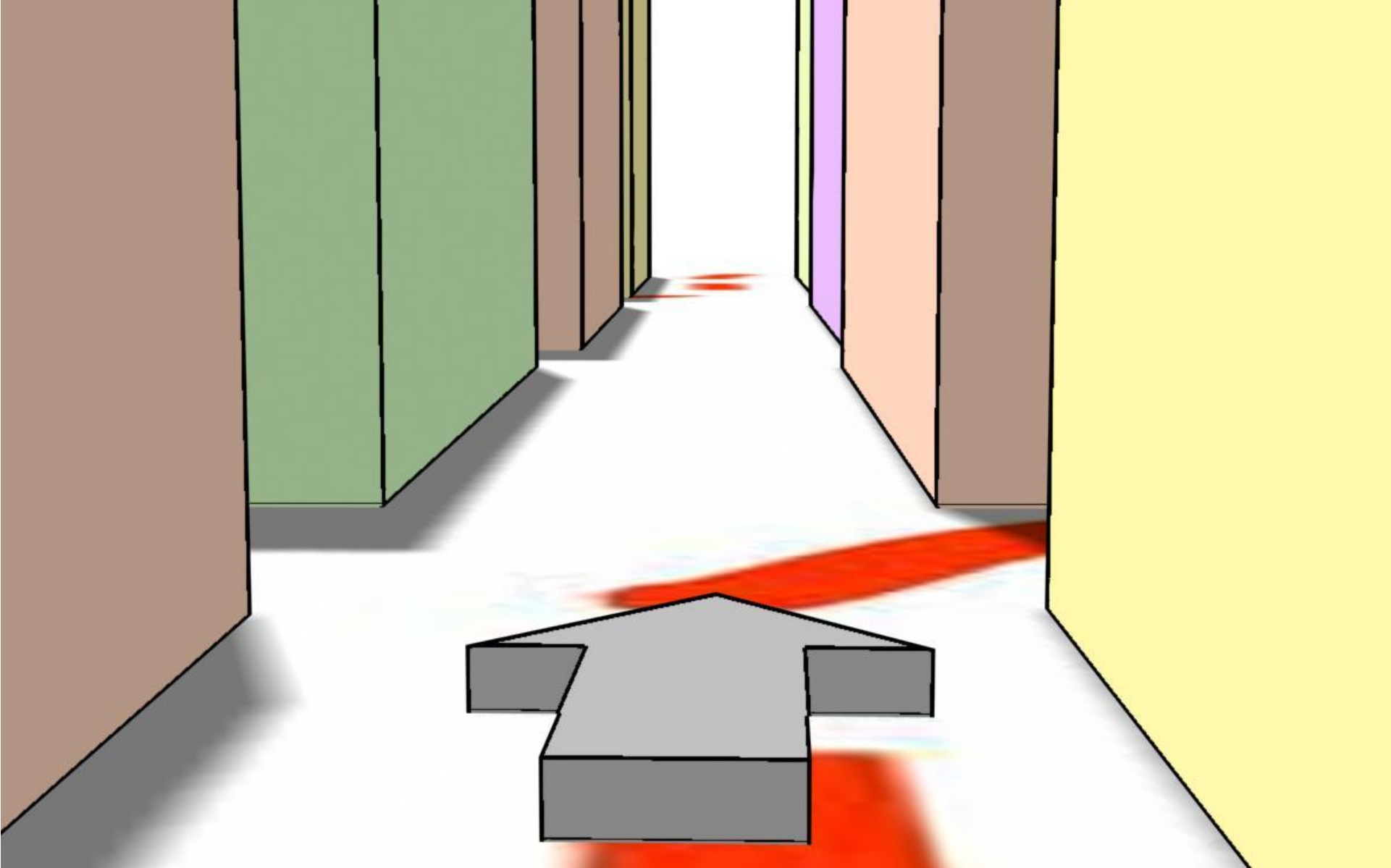


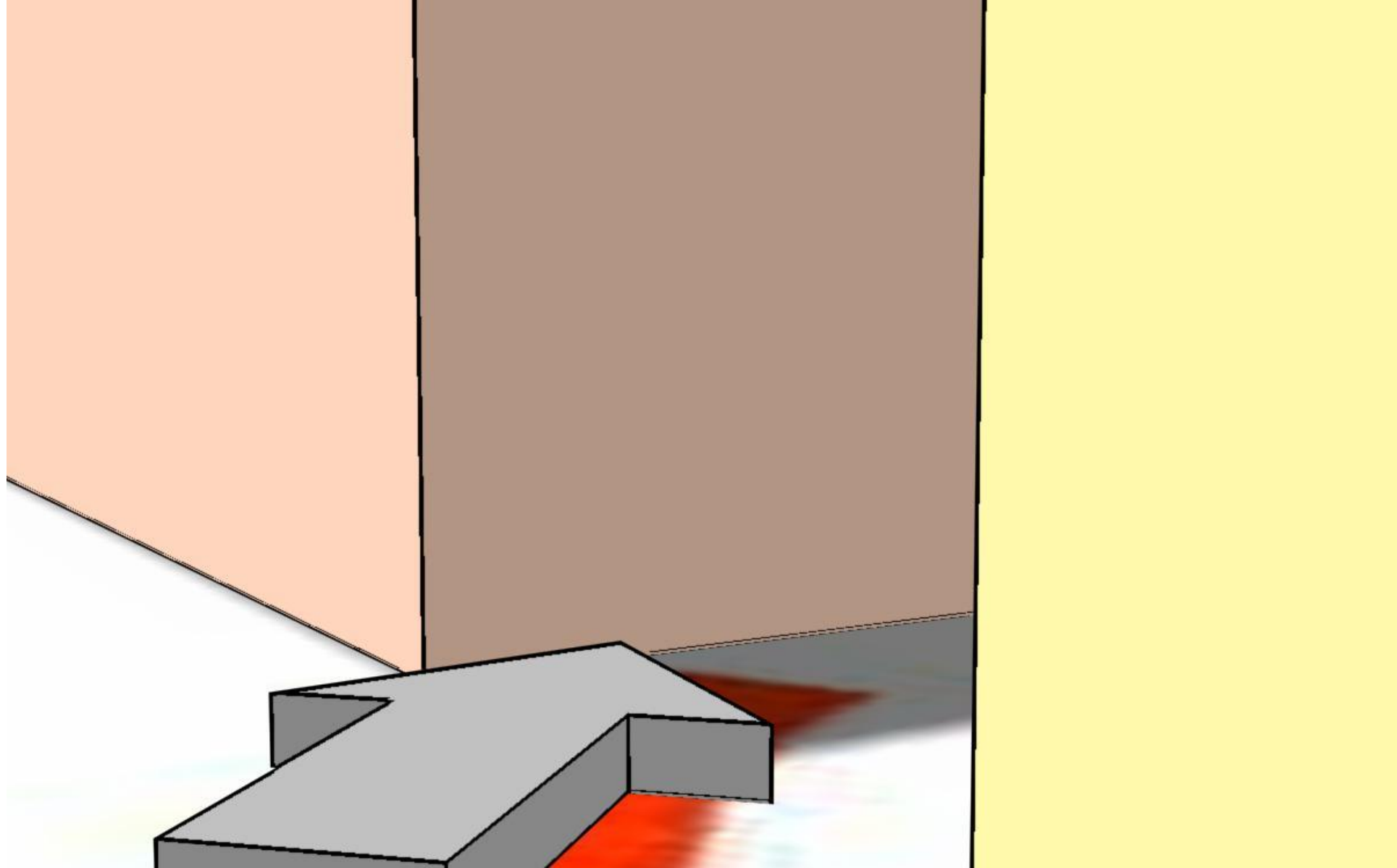


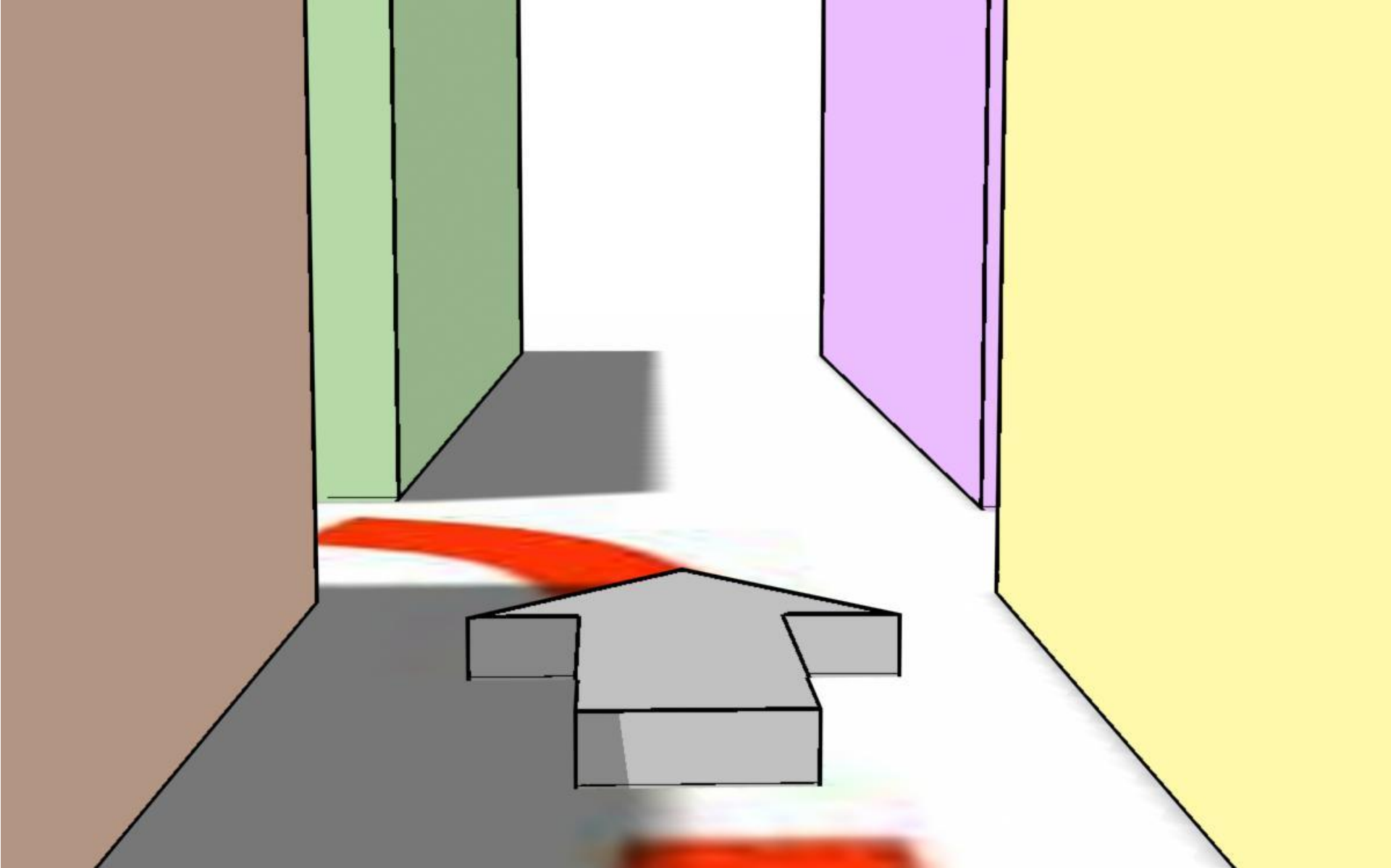


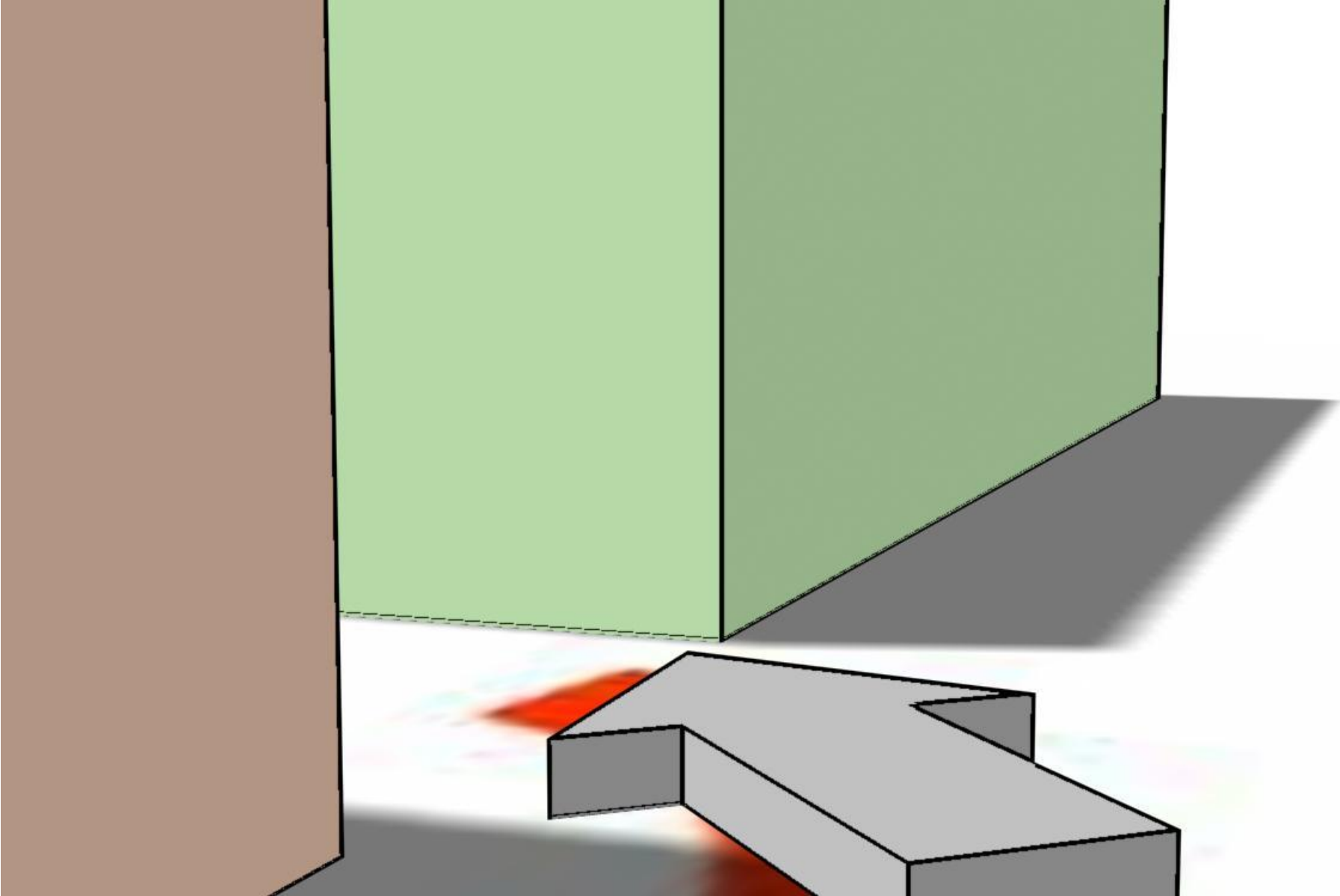


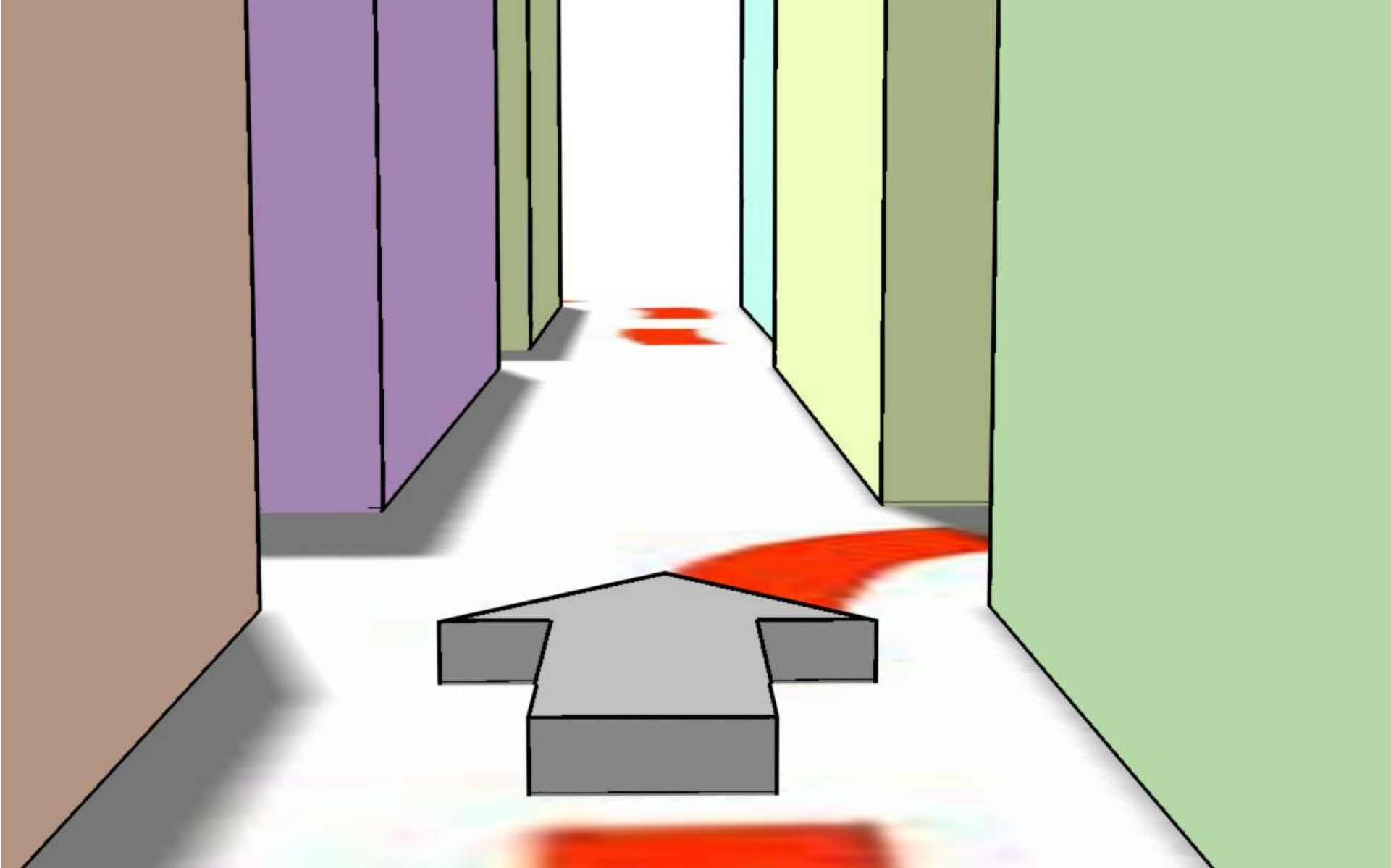


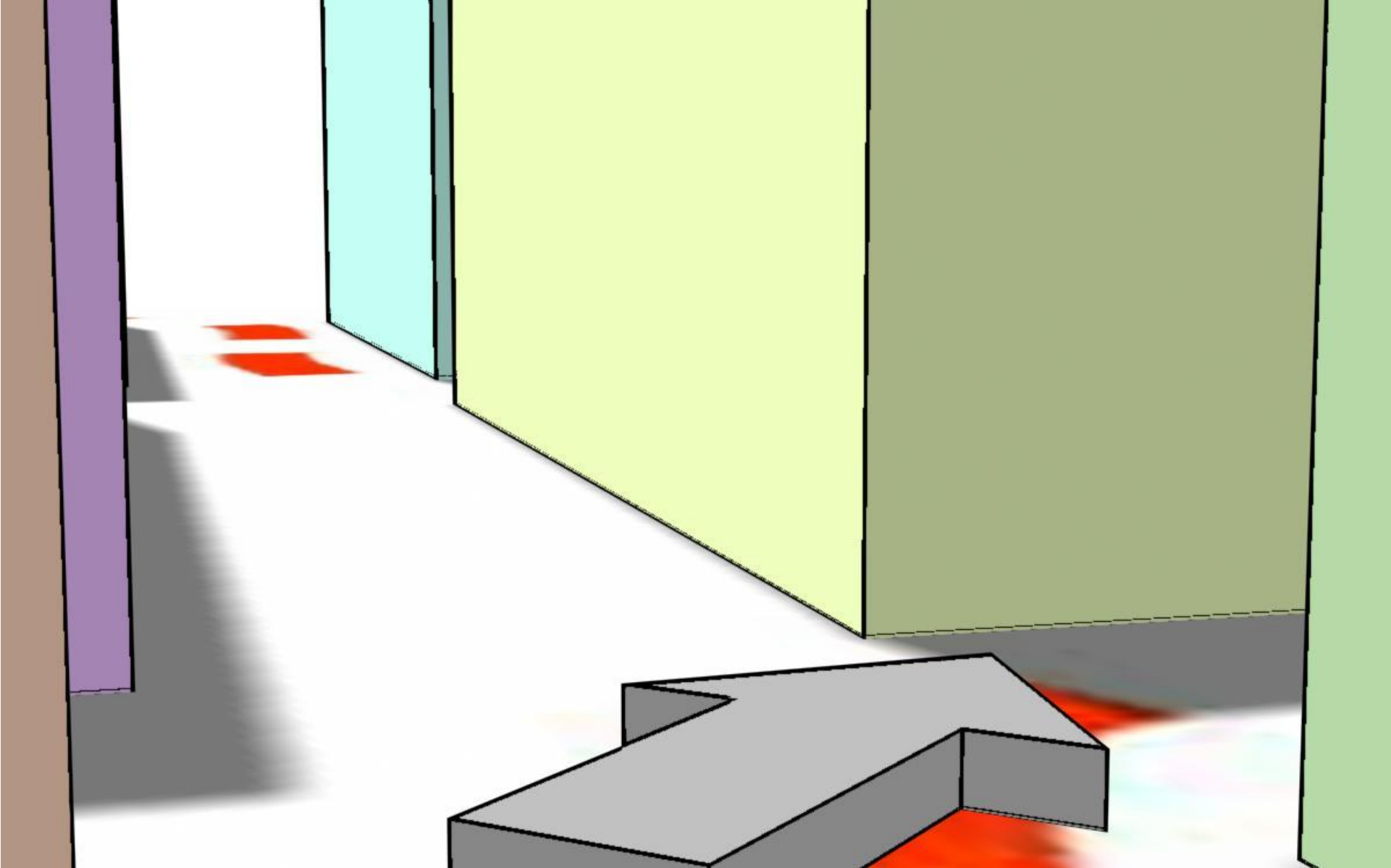


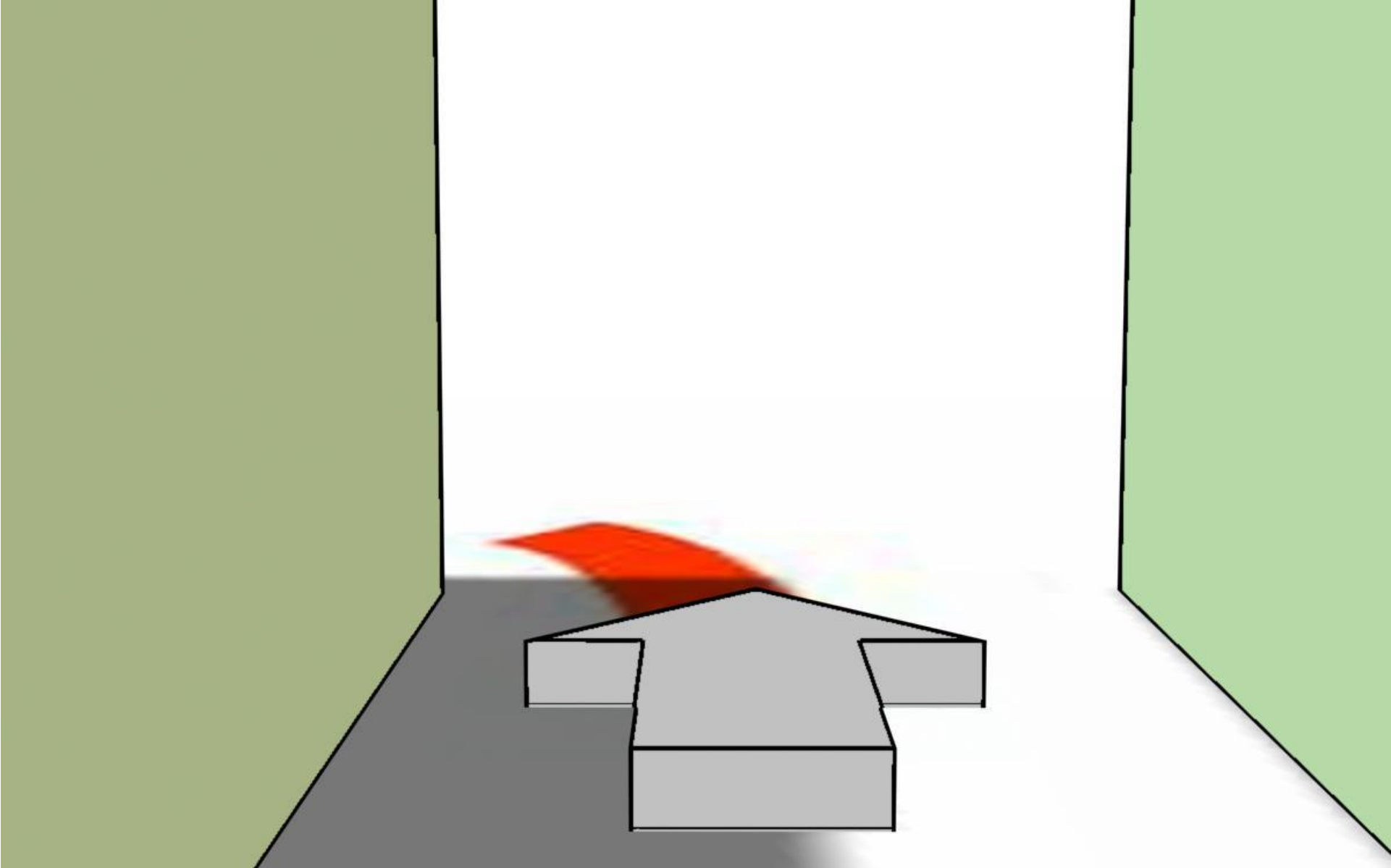


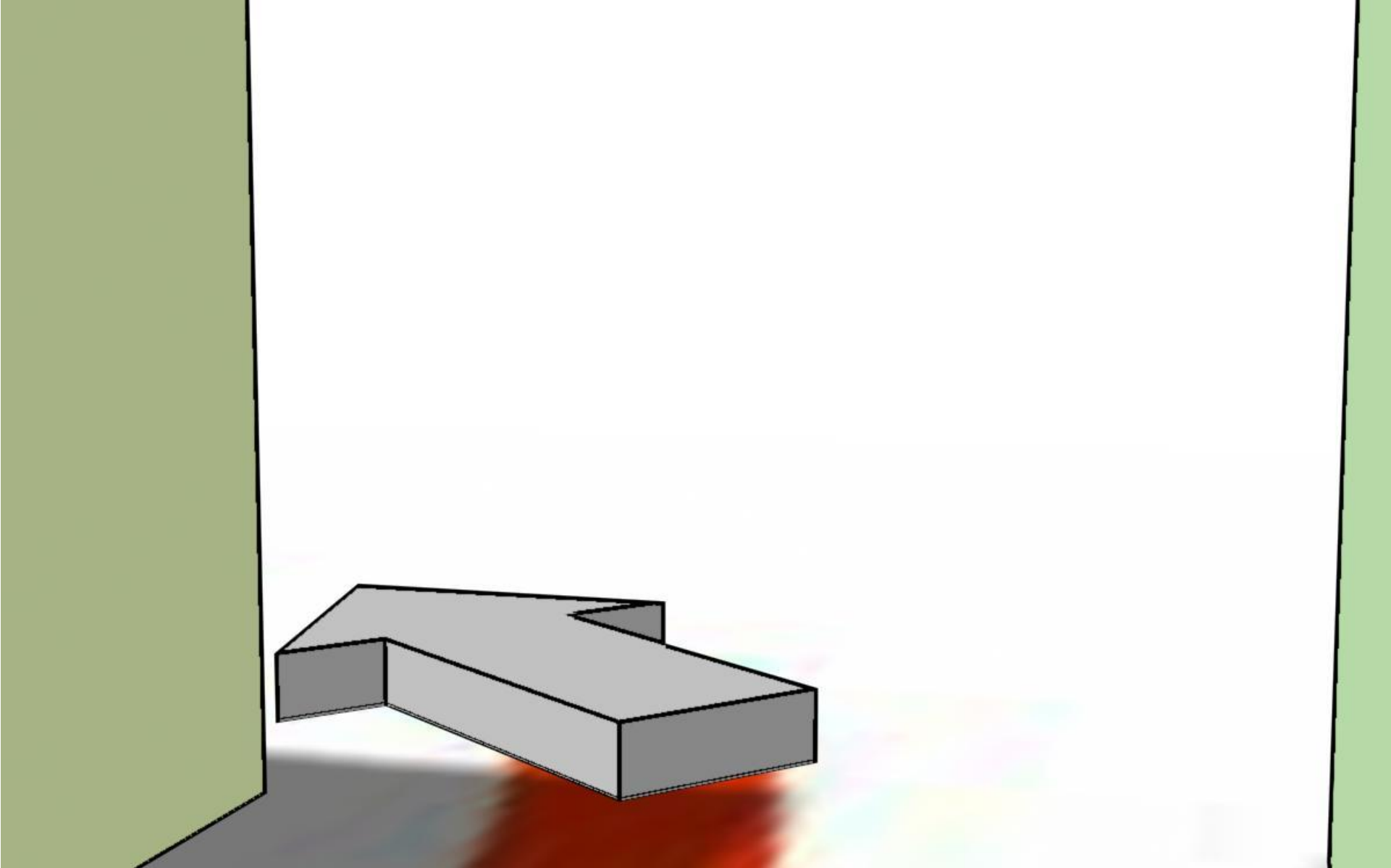


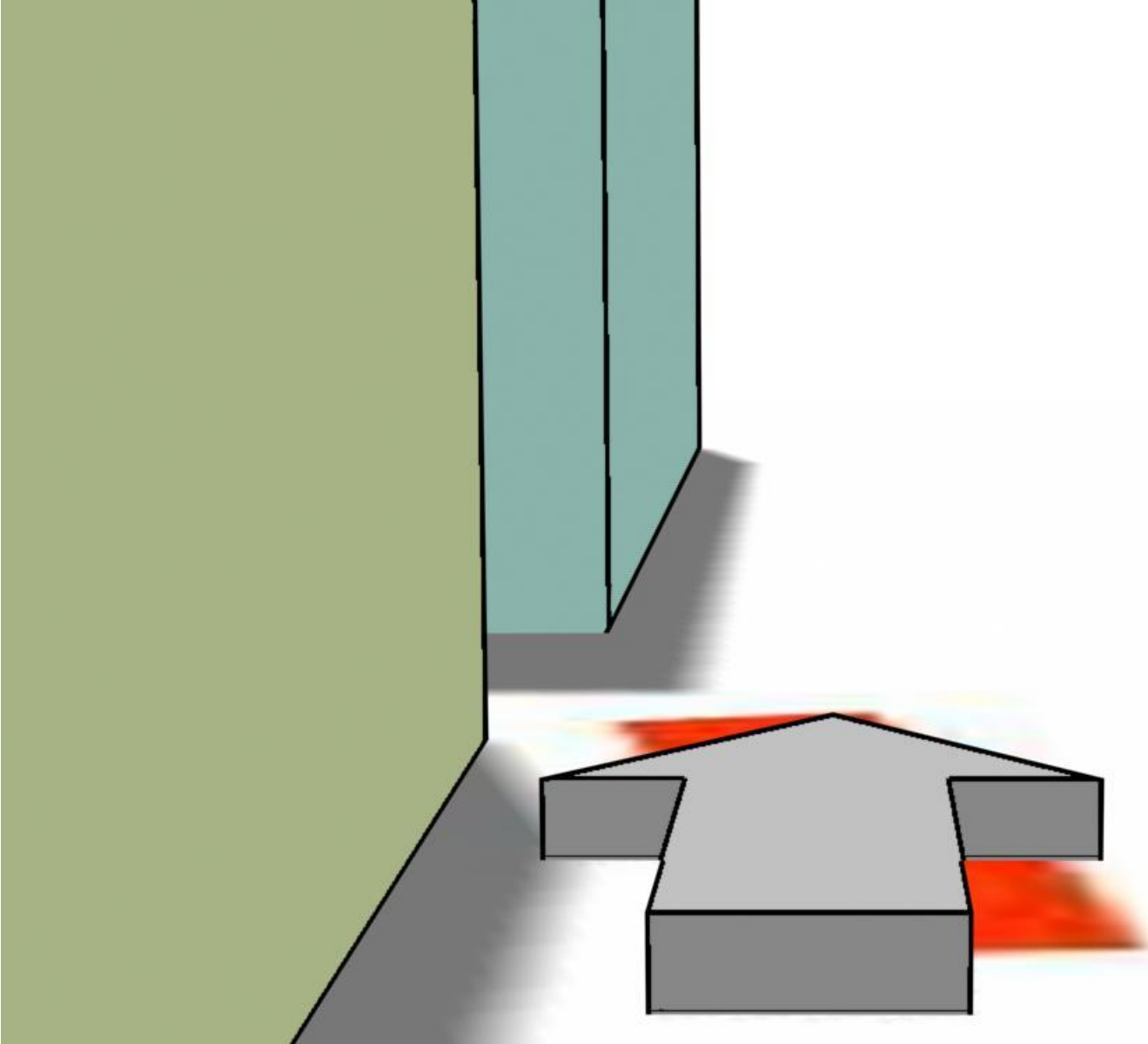


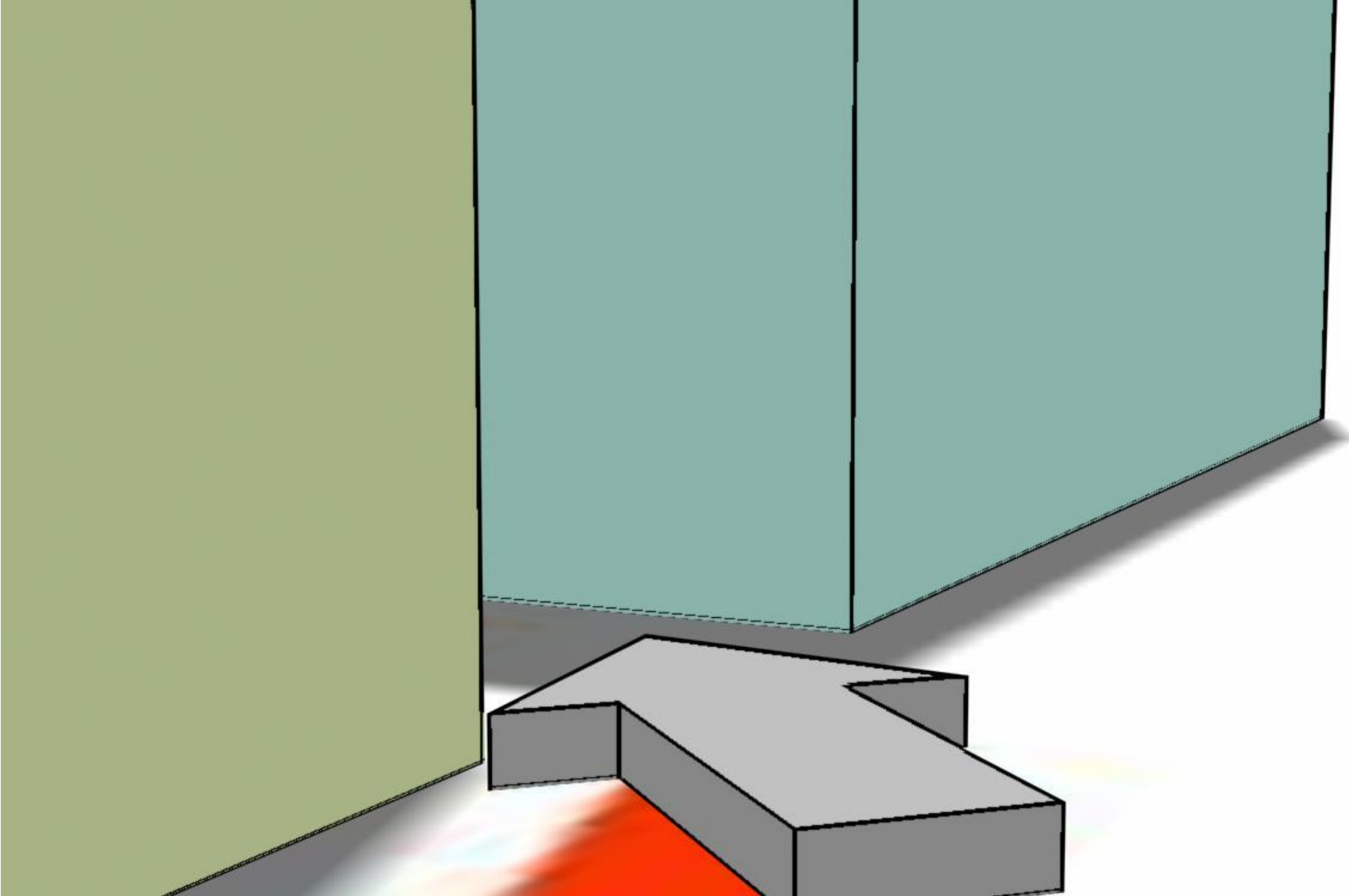


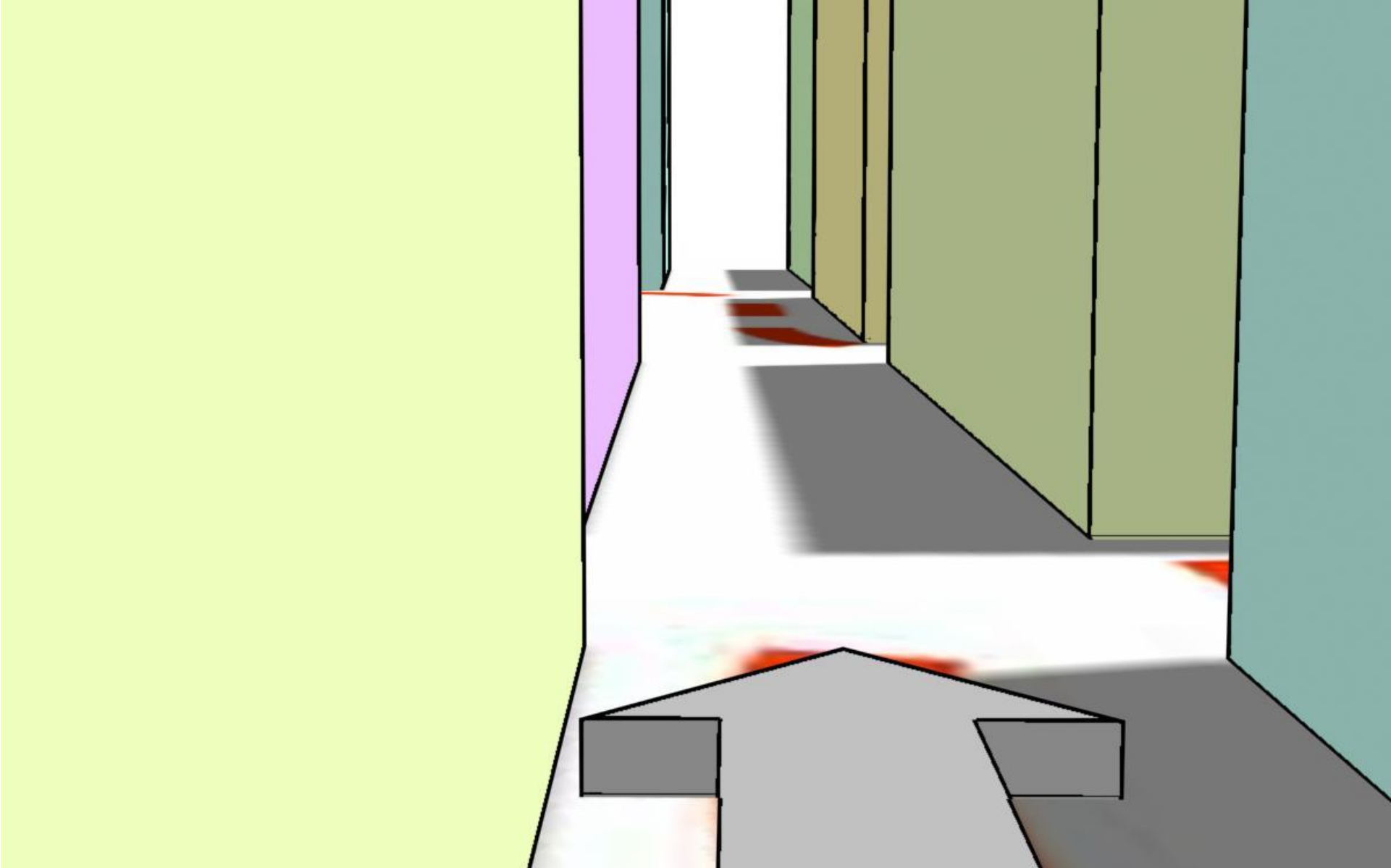


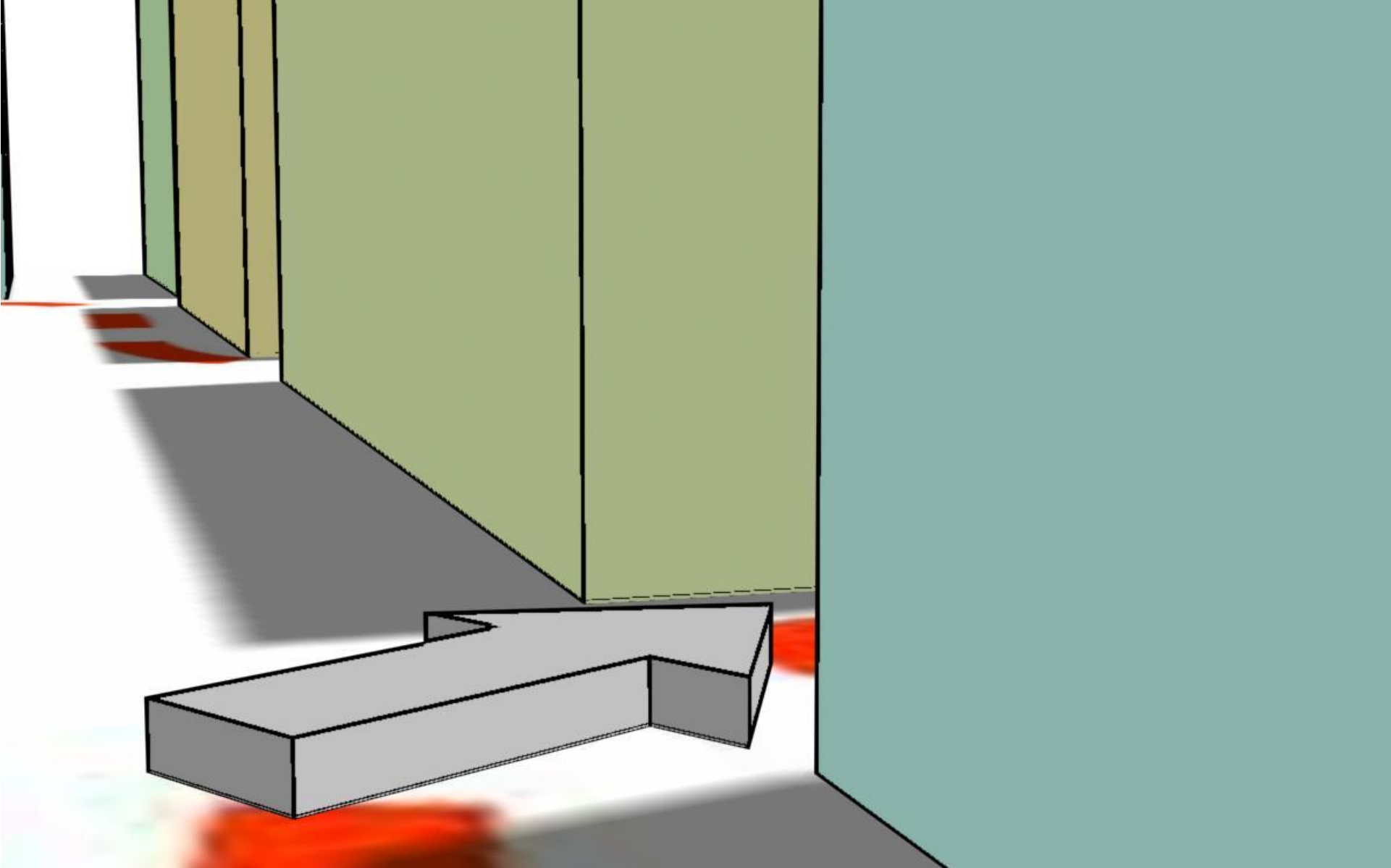


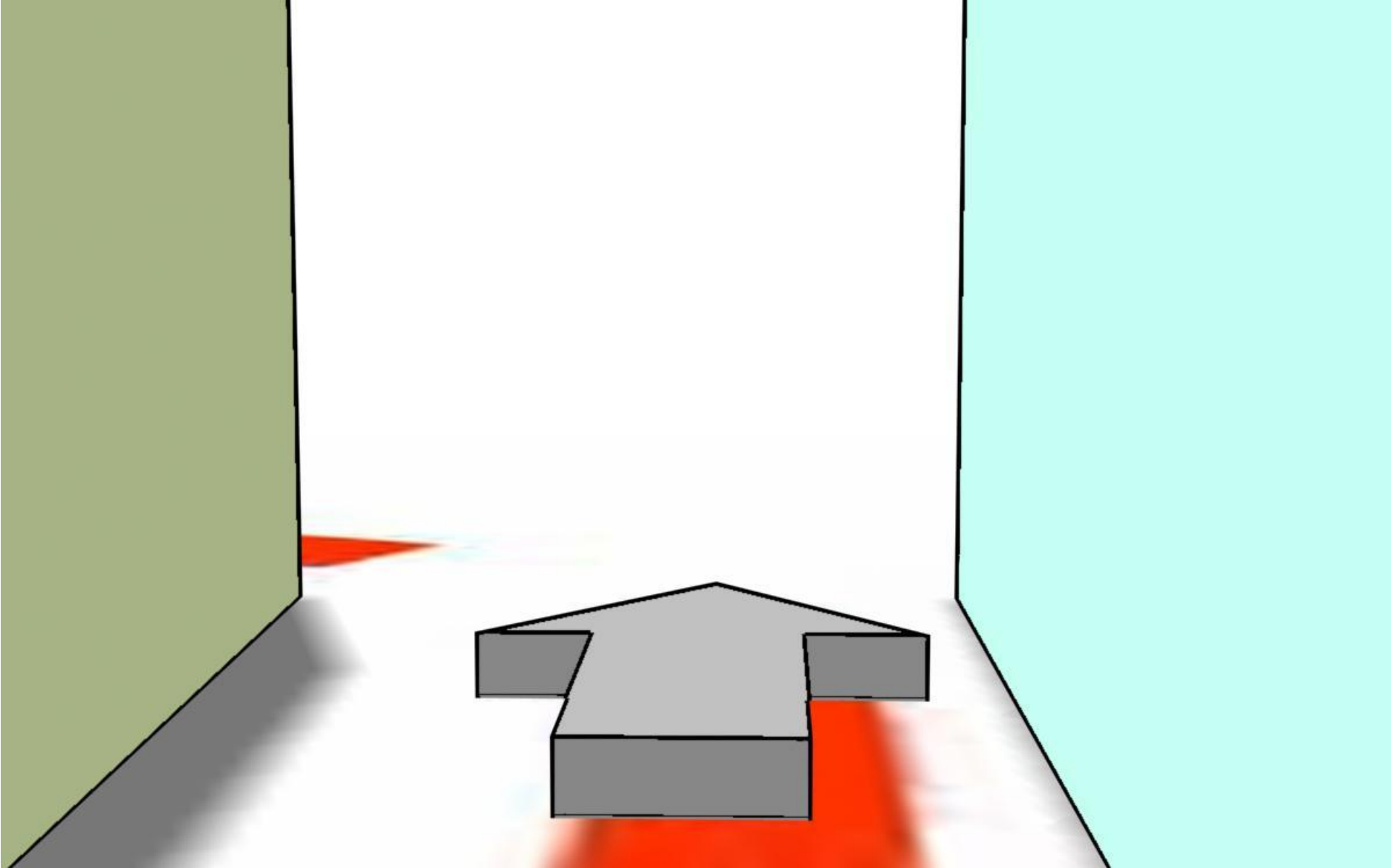


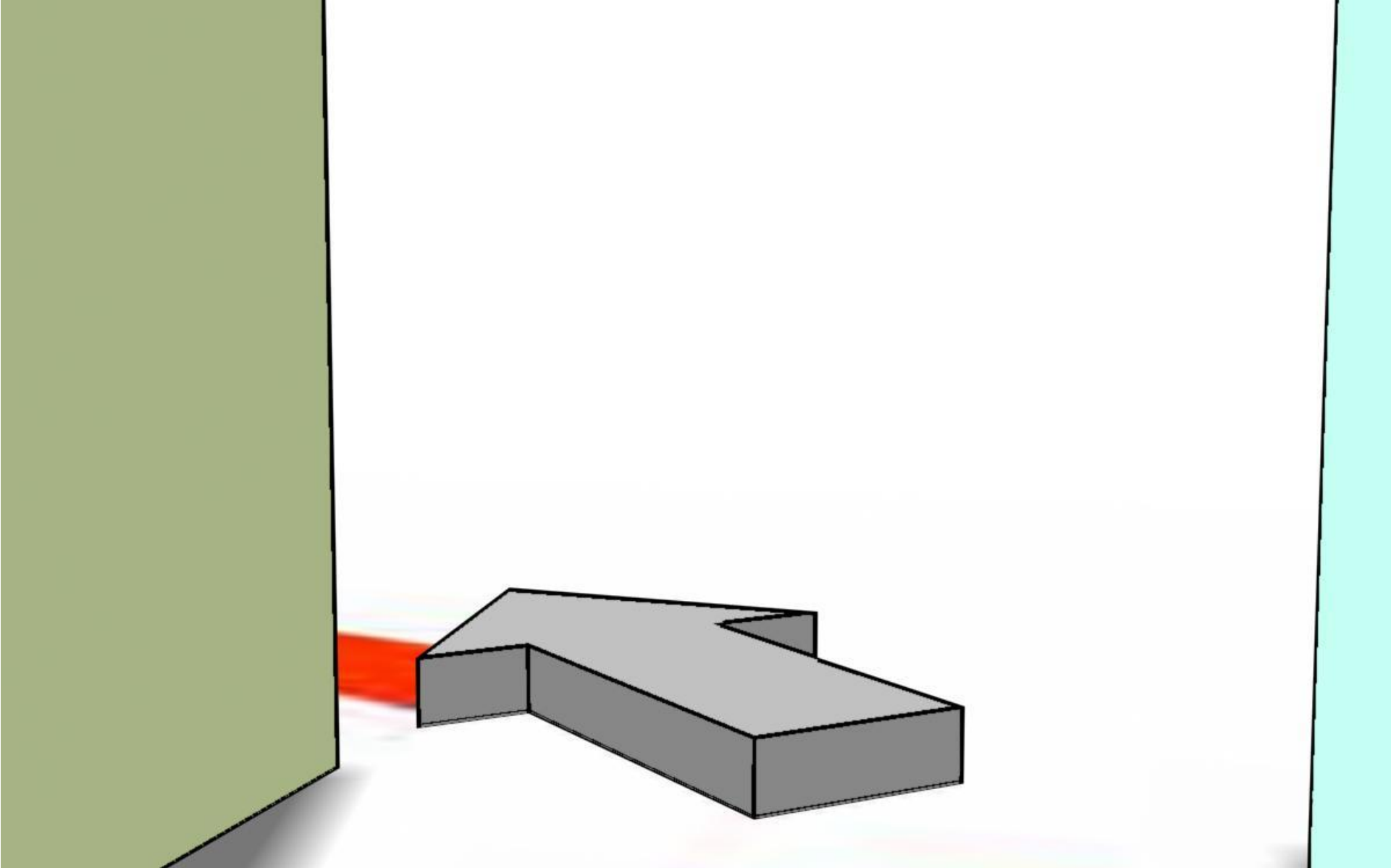


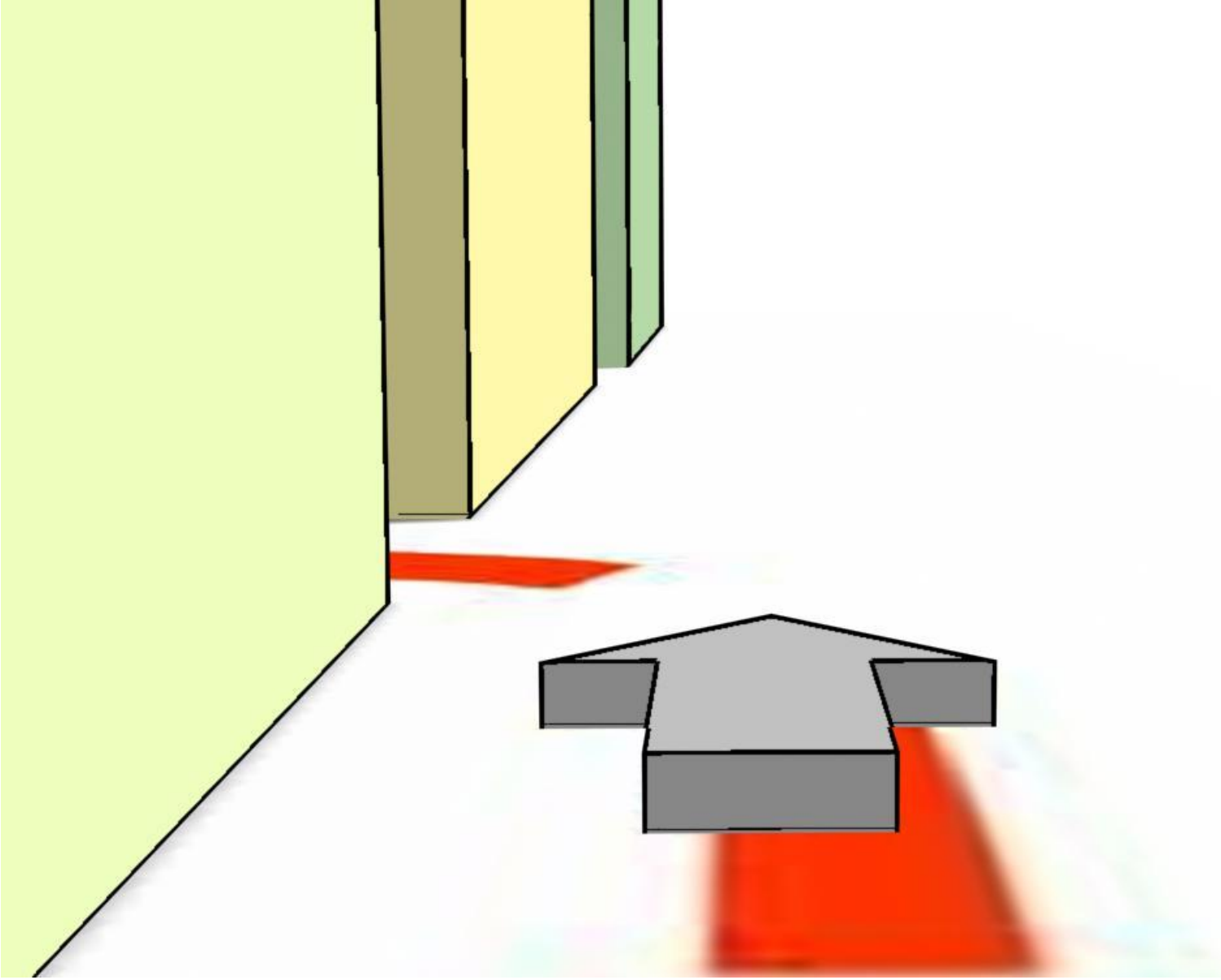


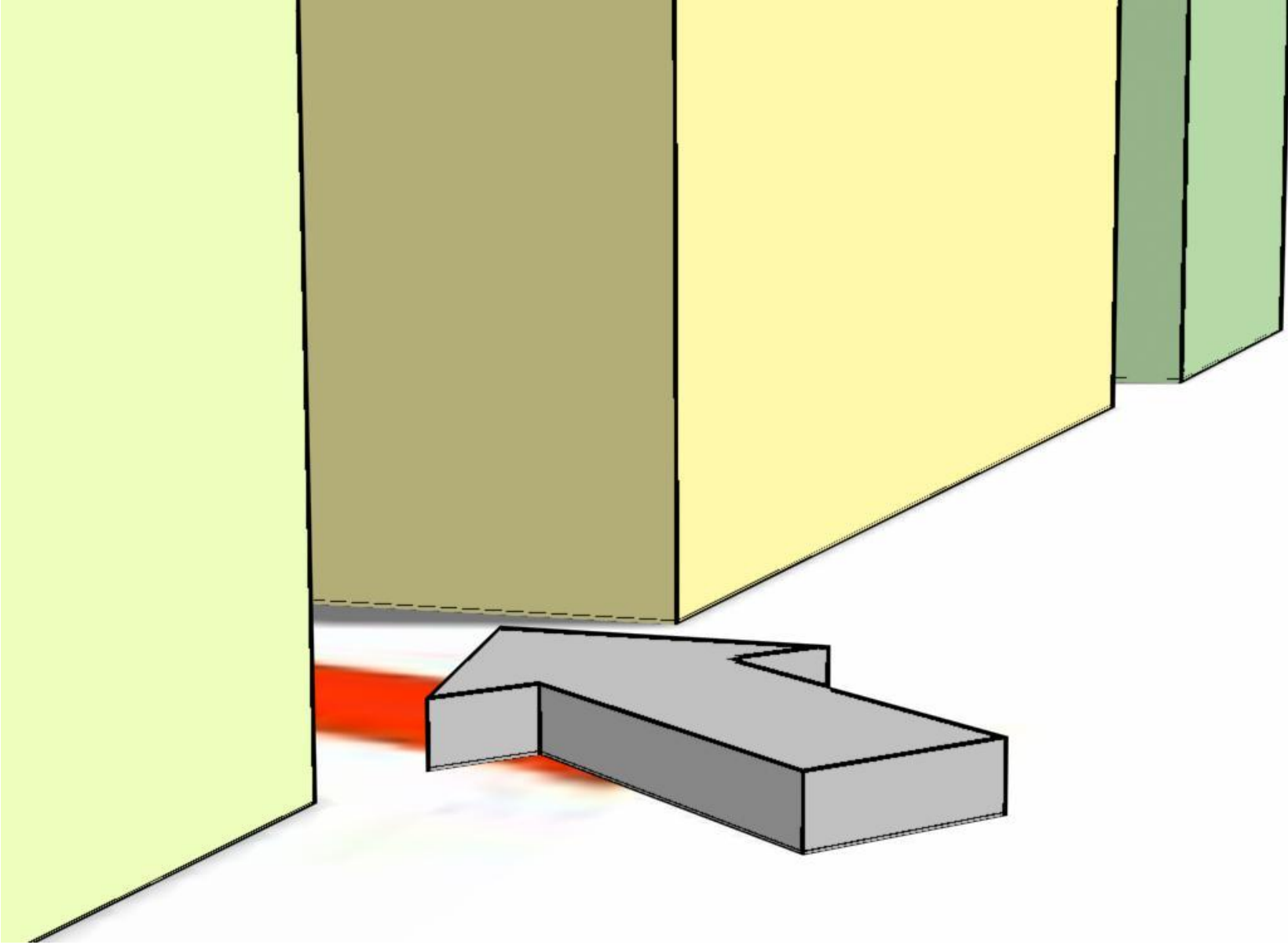


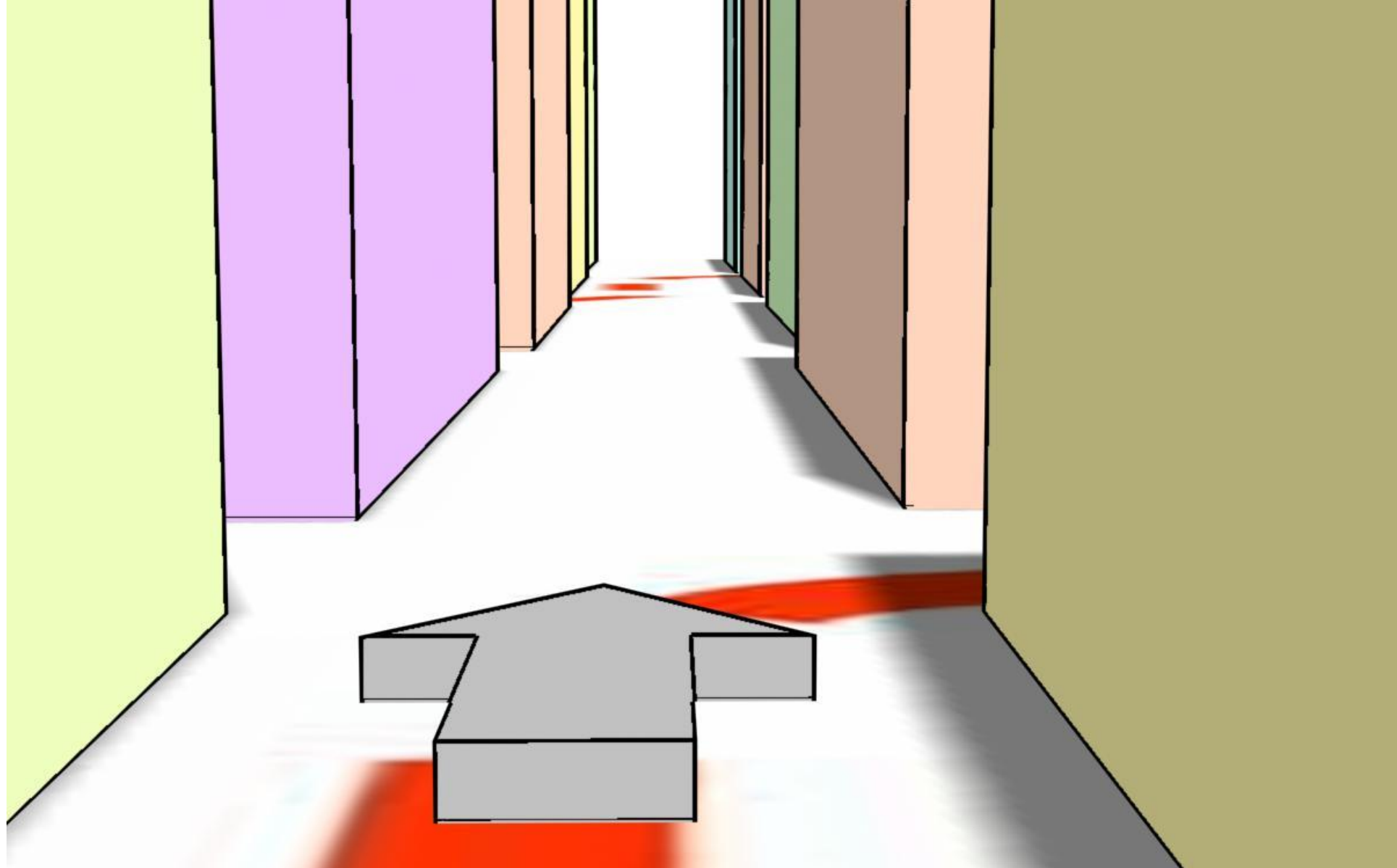


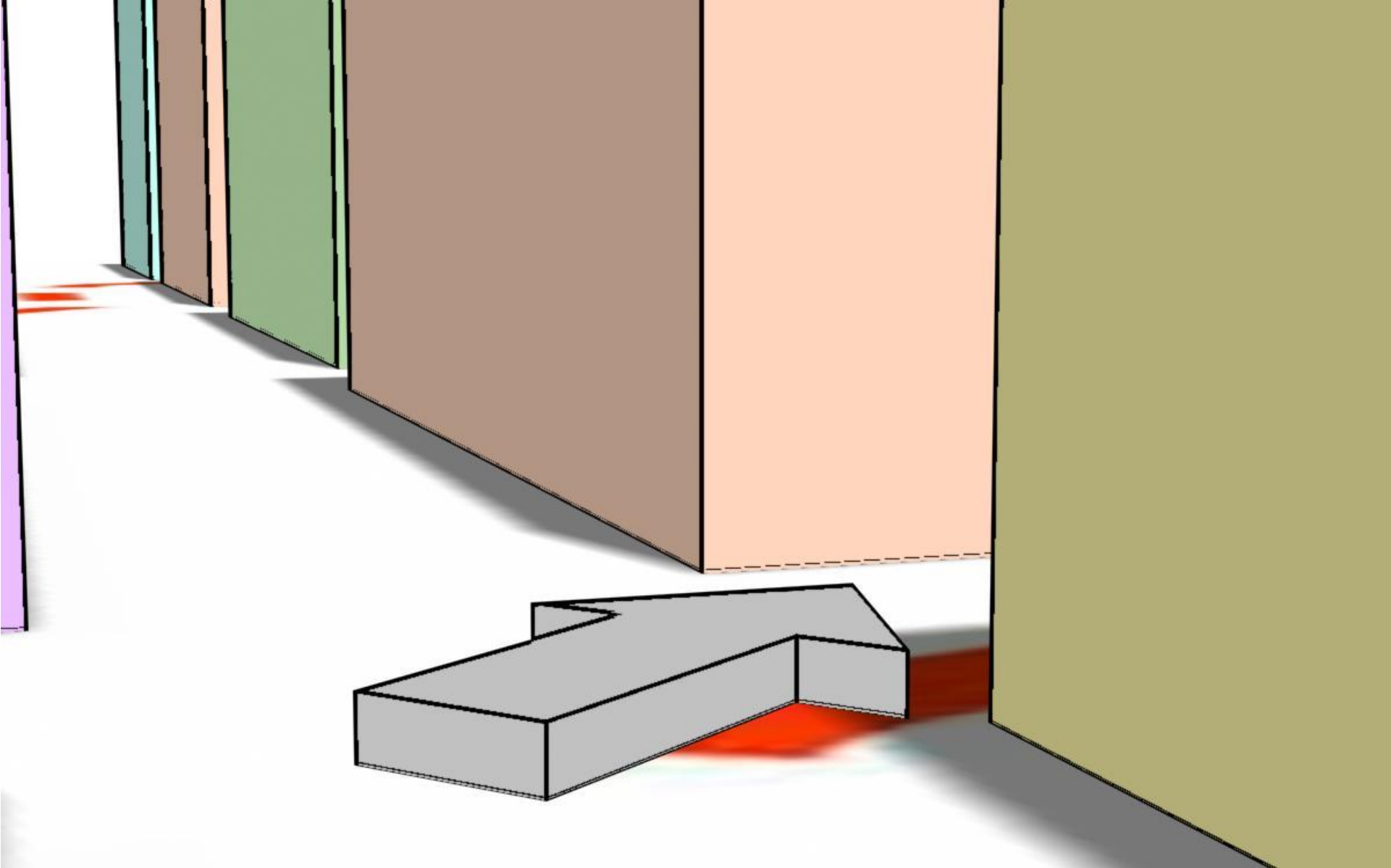


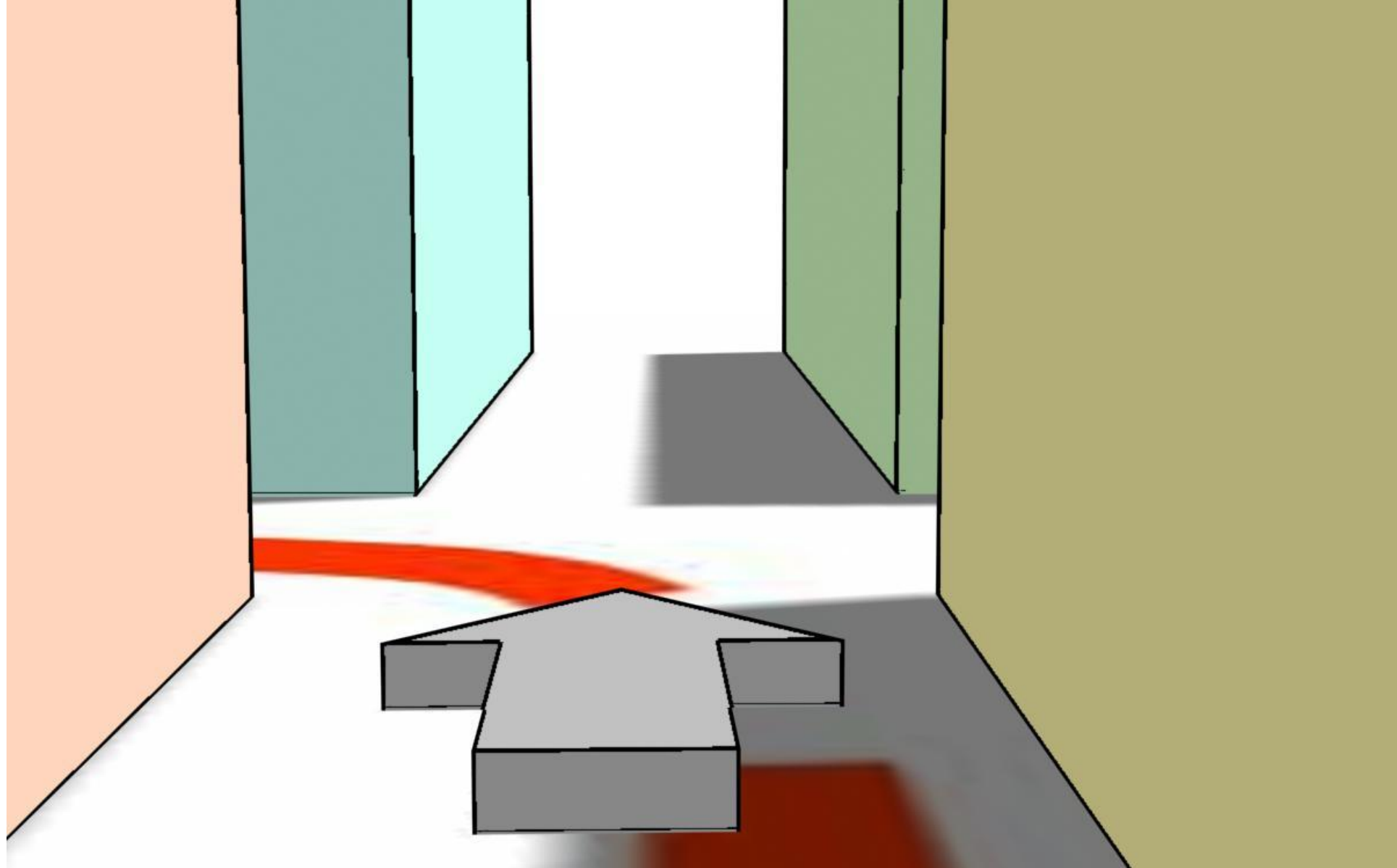


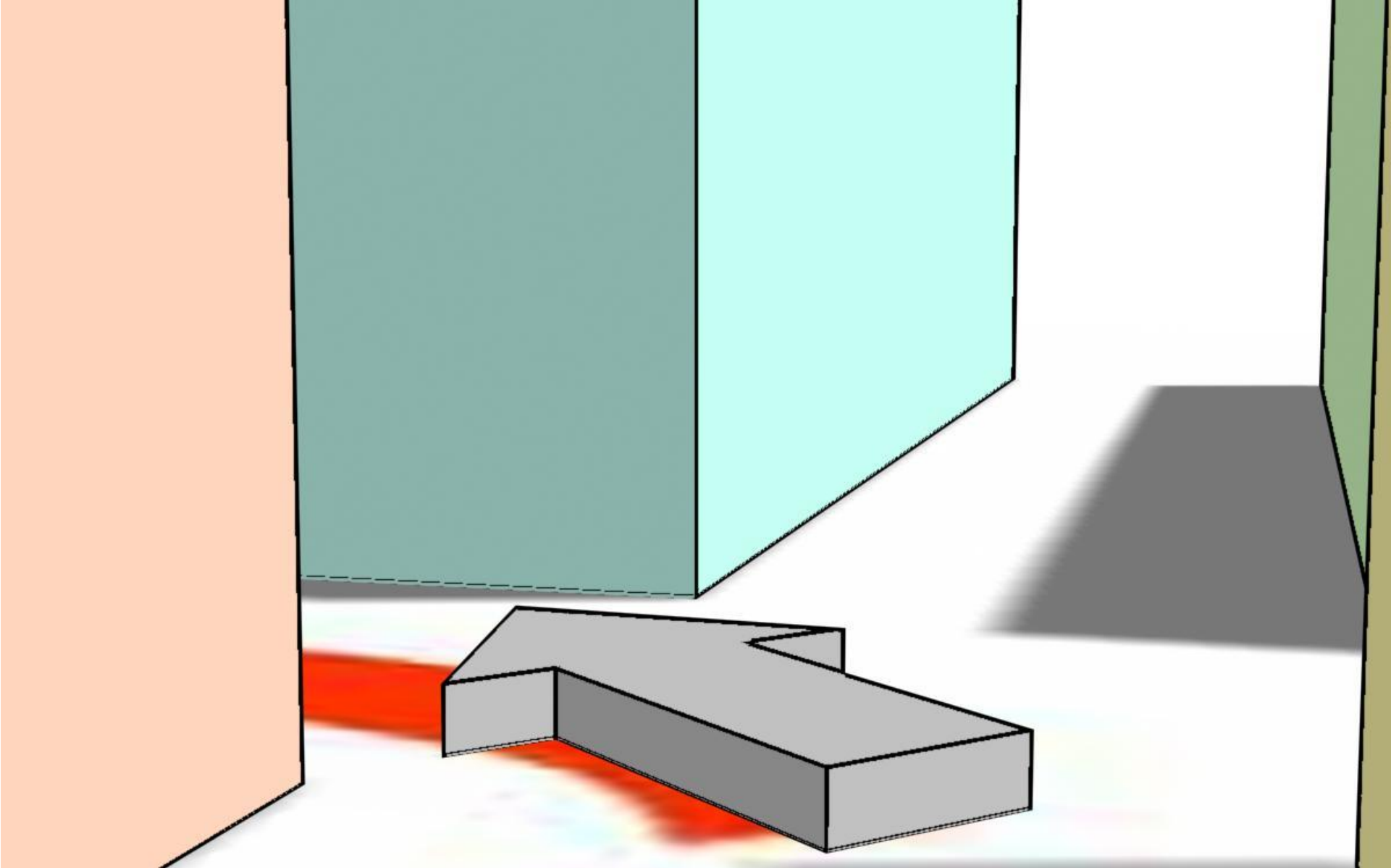


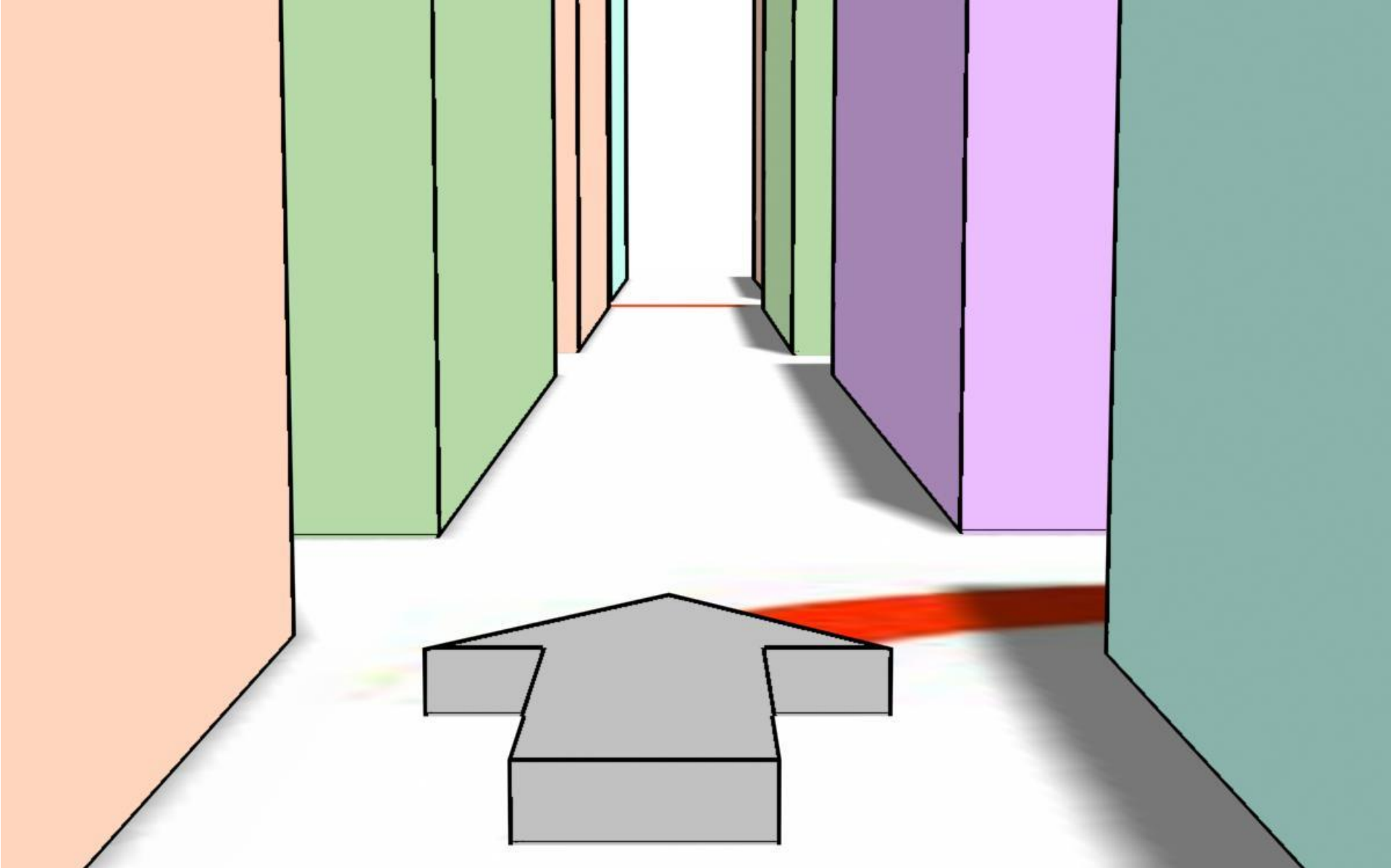


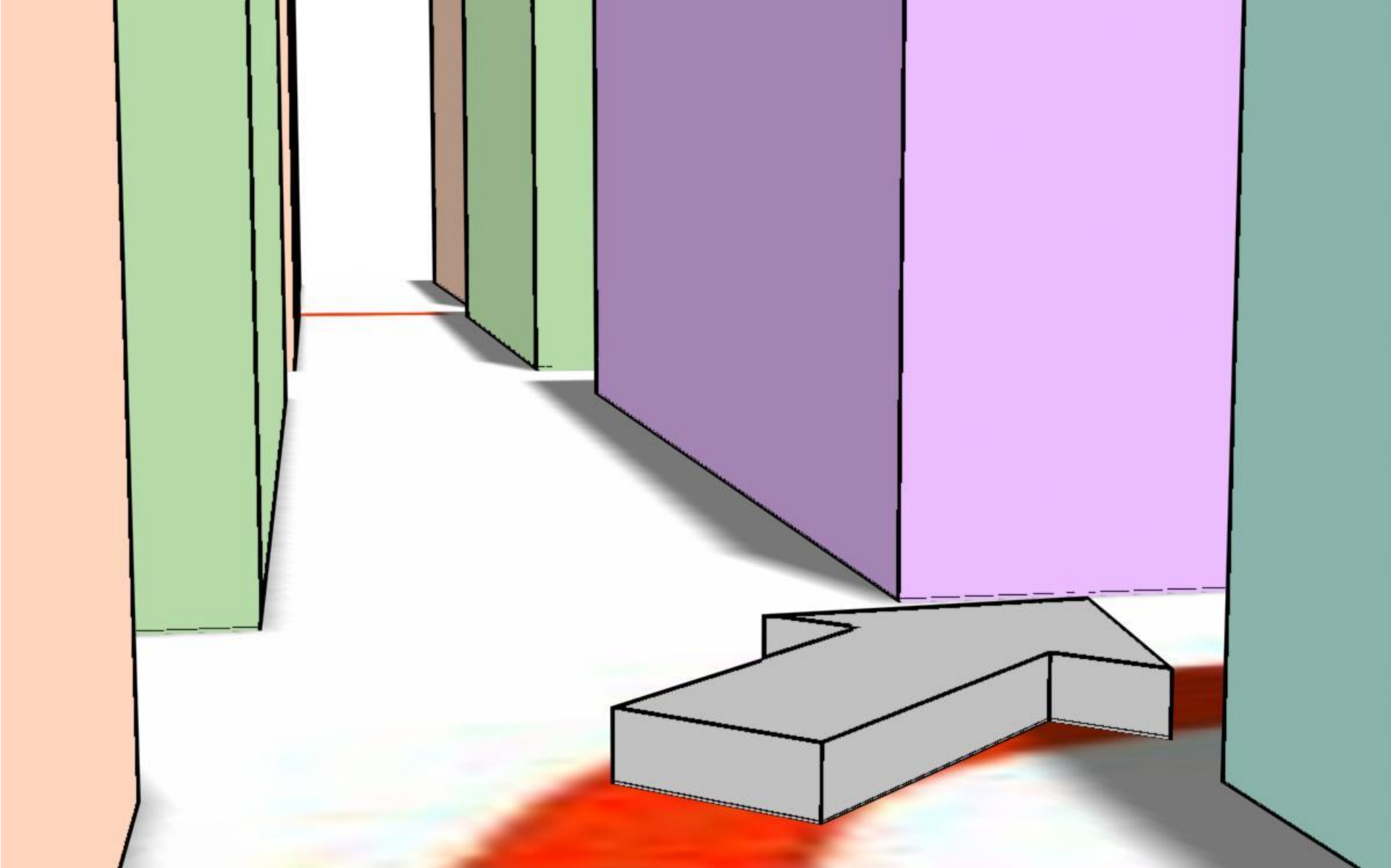


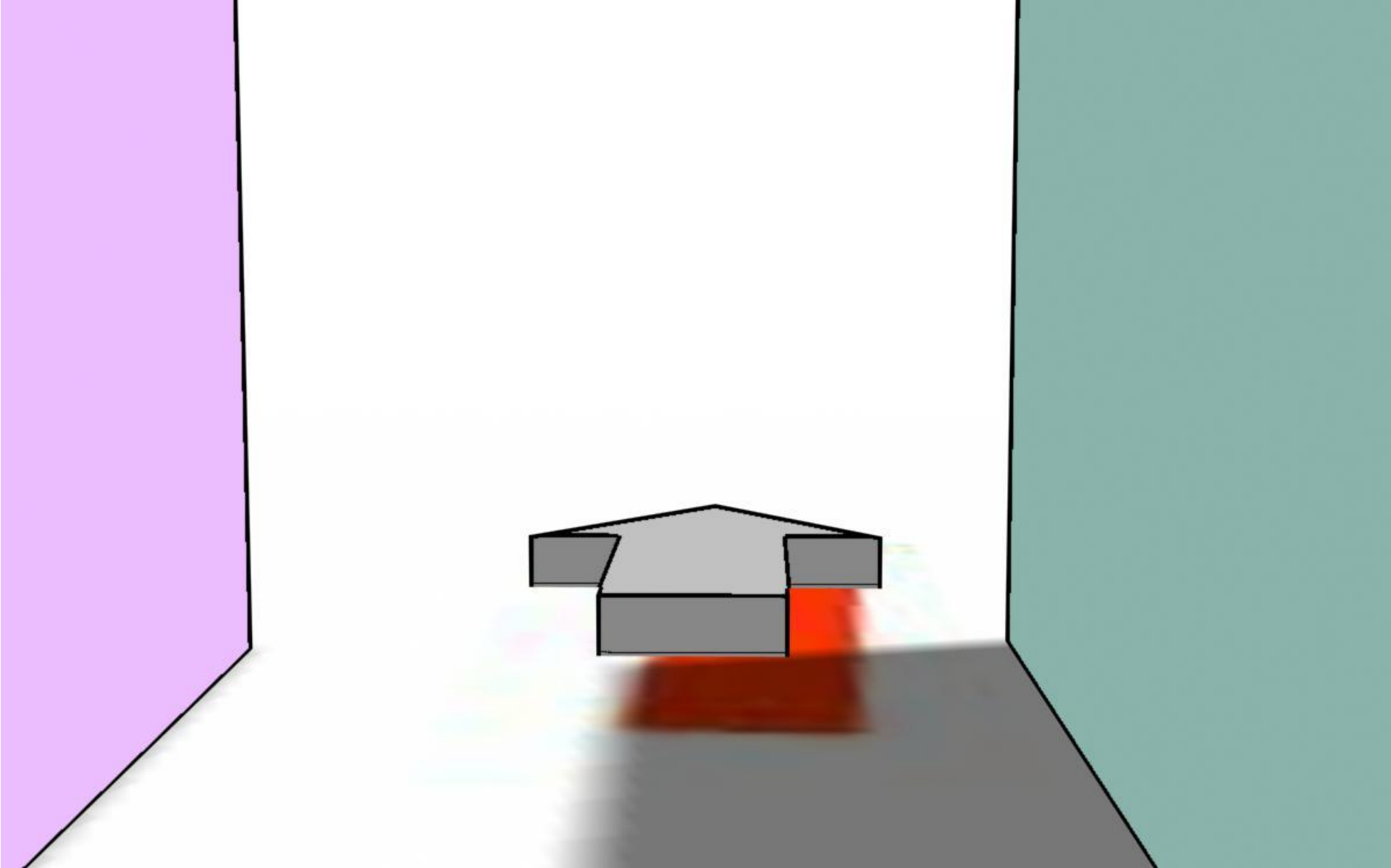




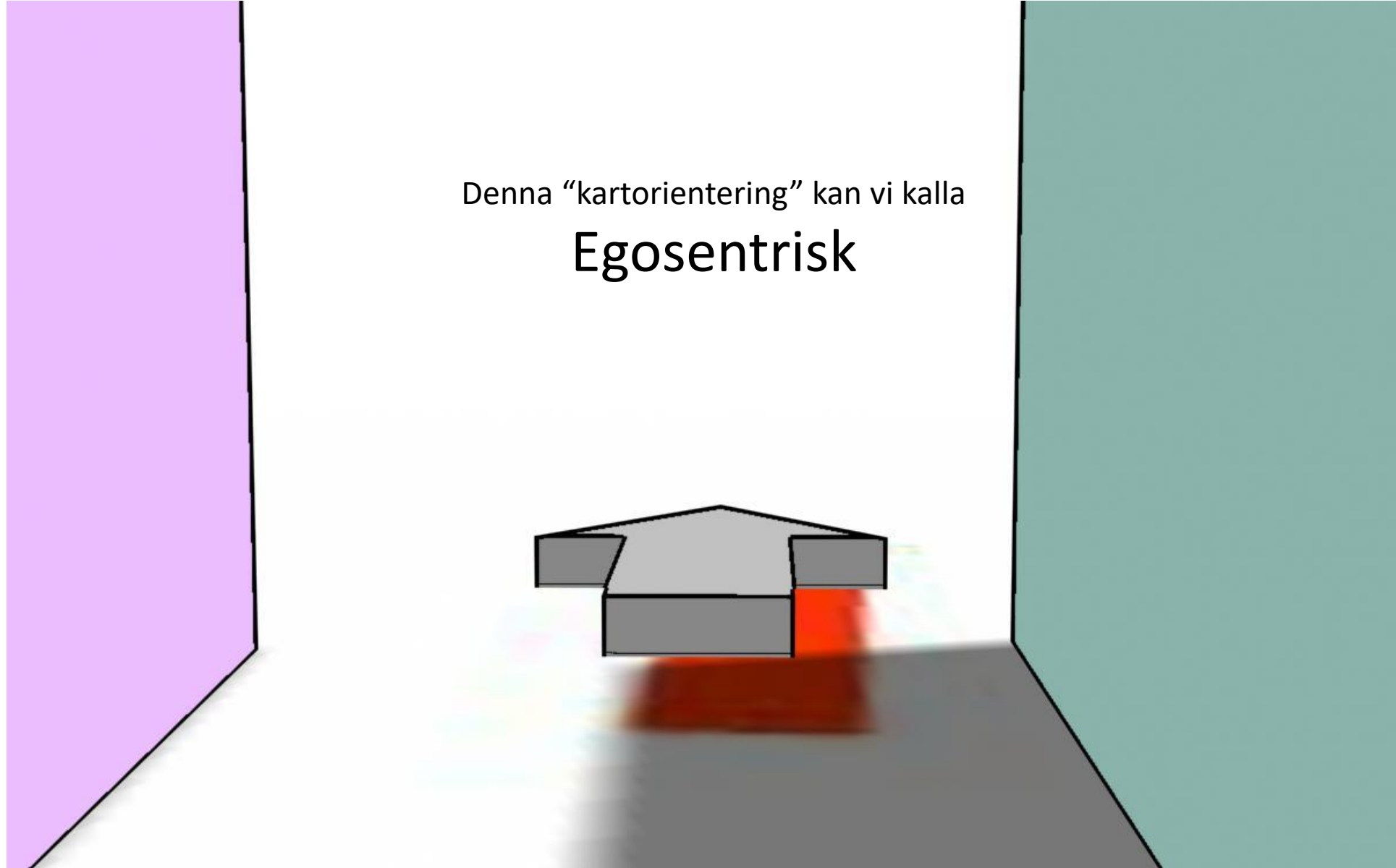








Denna "kartorientering" kan vi kalla
Egosentrisk



James Gibson: Optical Flow

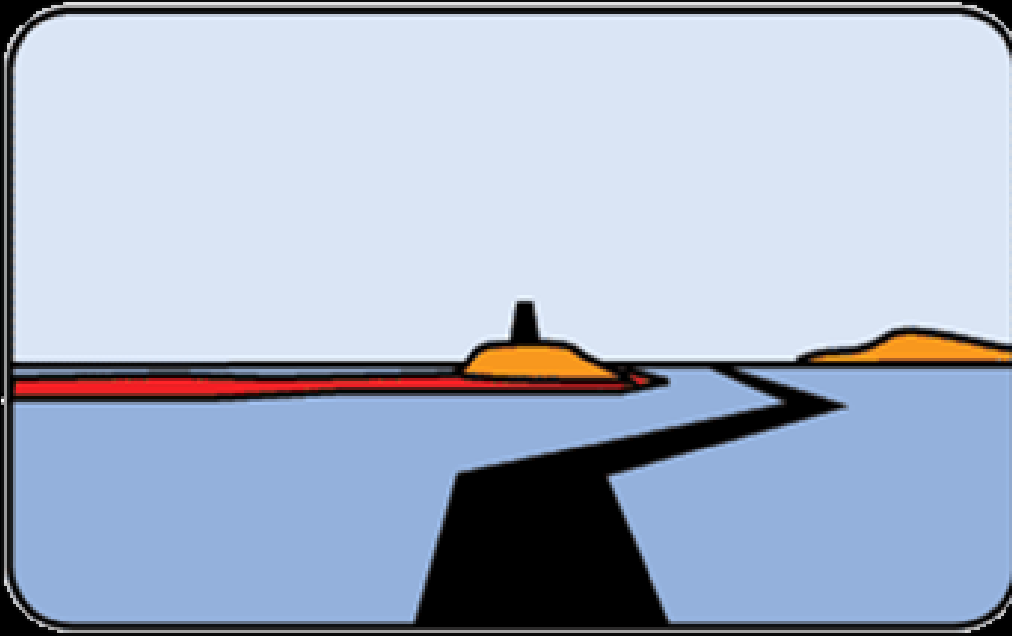


Warren, W.H. (1995). Self-motion: Visual perception and visual control. In W. Epstein & S. Rogers (Eds.) *Handbook of perception and cognition: Perception of space and motion*. (pp. 263-323) New York, Academic Press.

James Gibson: Optical Flow

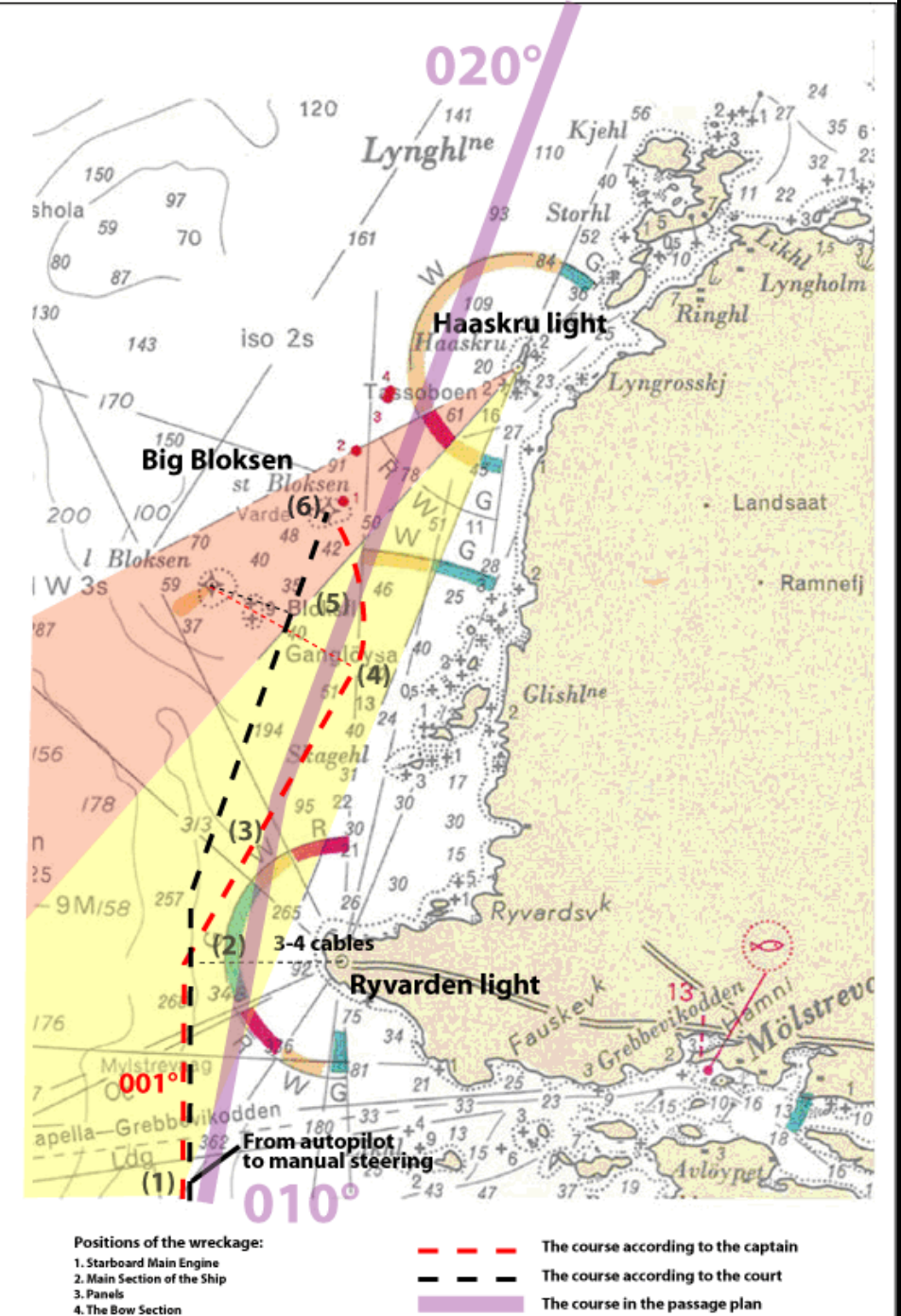


Warren, W.H. (1995). Self-motion: Visual perception and visual control. In W. Epstein & S. Rogers (Eds.) *Handbook of perception and cognition: Perception of space and motion*. (pp. 263-323) New York, Academic Press.



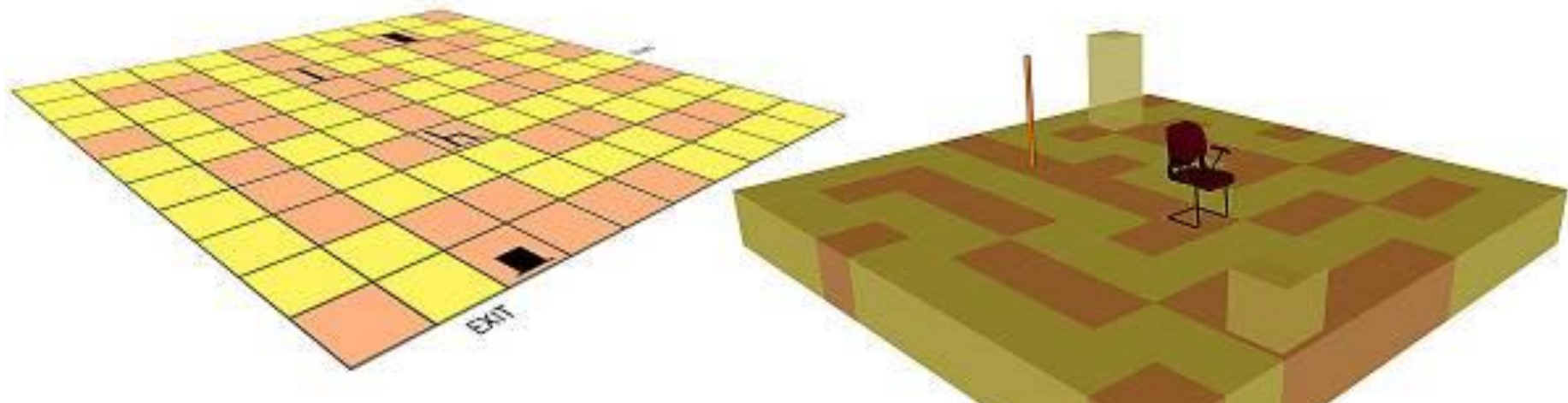
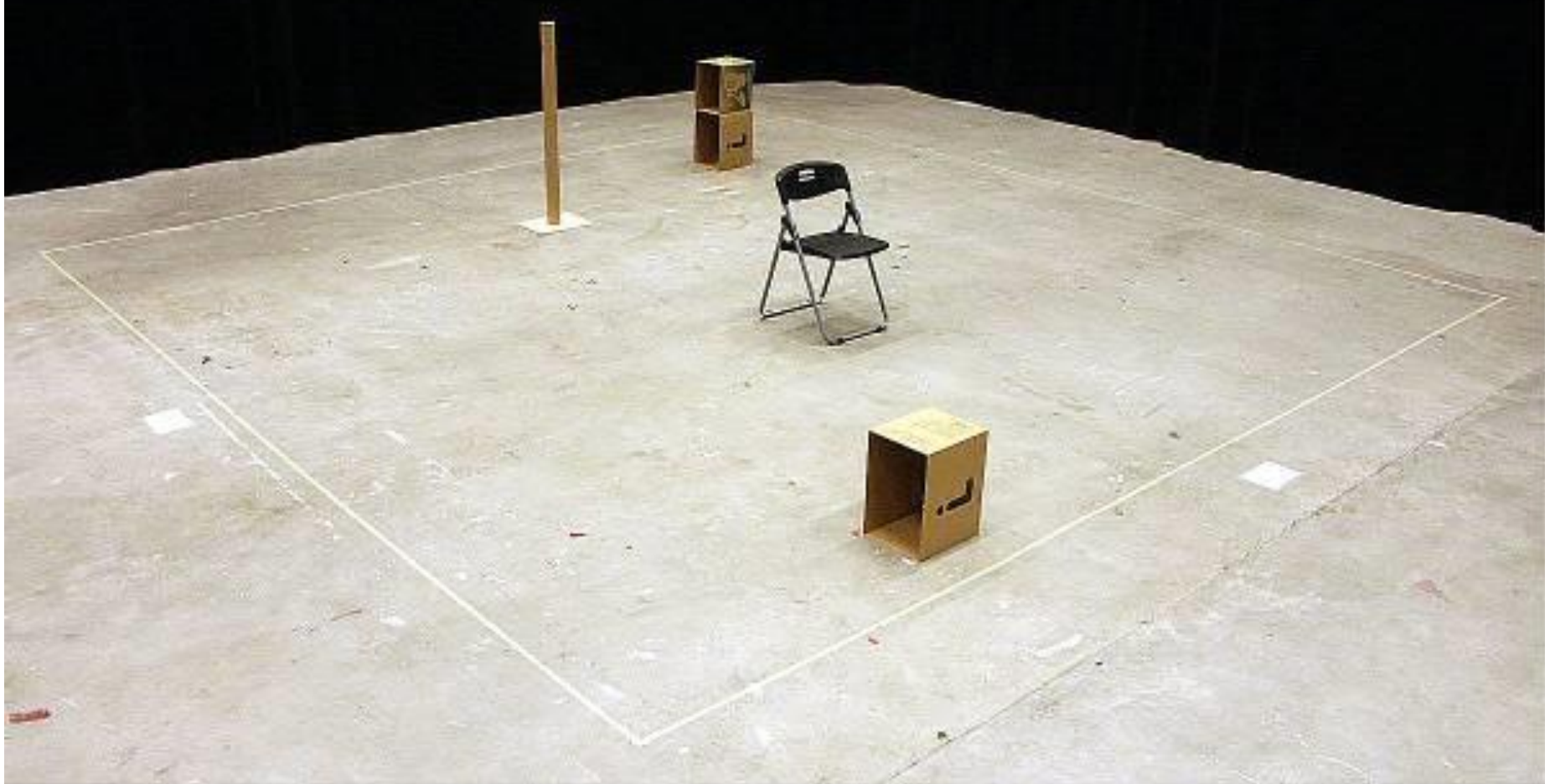
Porathe, 2006

Egosentrisk 3D kartvy)



Laboratory experiment in route guidance

using north-up, head-up and egocentric modes



Three studies

MDU
The University
group 2005

45 participants

Age: 16 - 63

21 women

24 men

CTH
The Bridge
Officer group
2007

30 participants

Age: 22 – 54, all men

18 combat boat drivers,
6 Experienced, active bridge
crew members

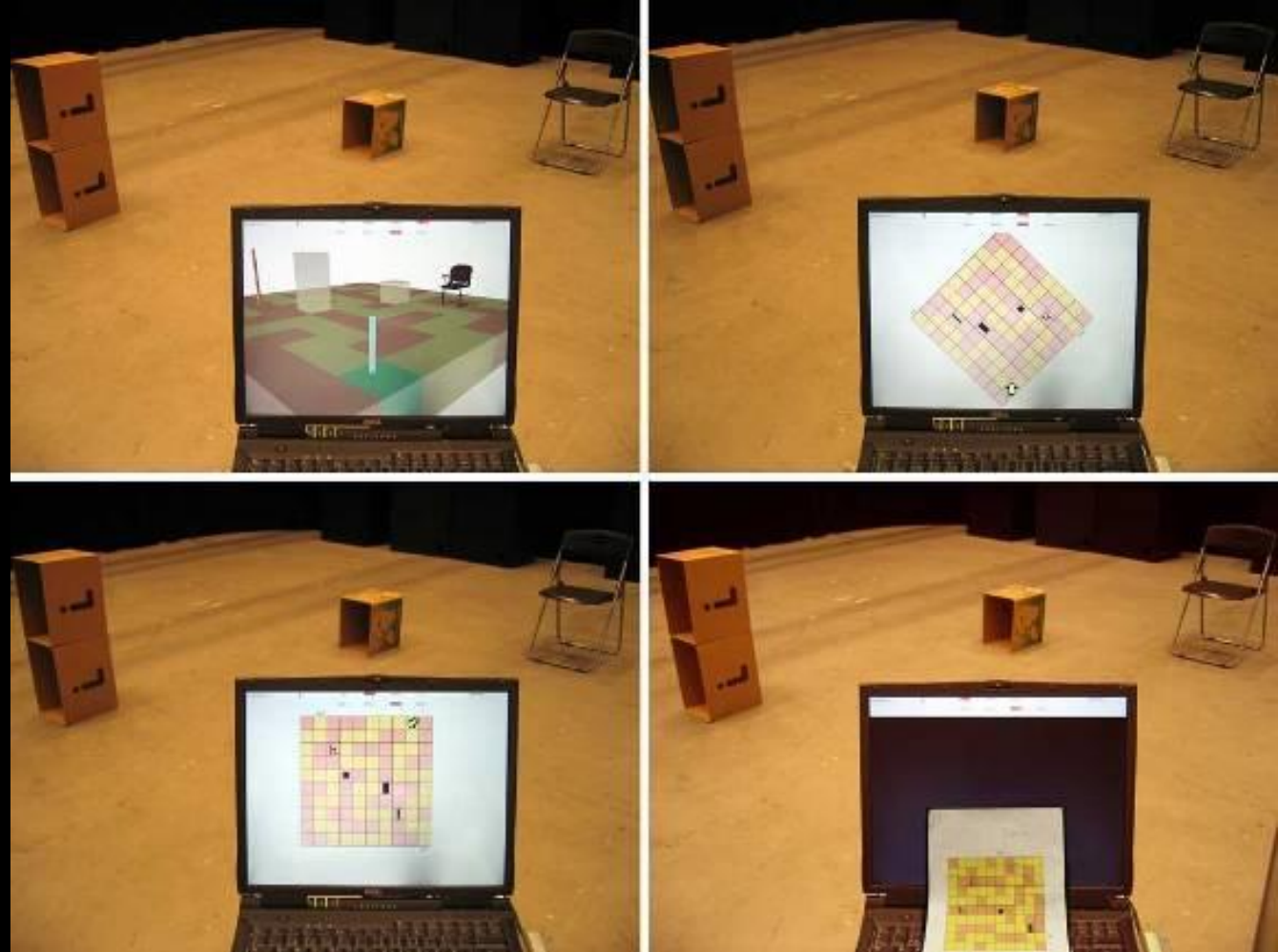
6 Cadets

DMU
The Chinese
bridge officer
student group
2011

32 cadets

Age: 20 – 24, all men

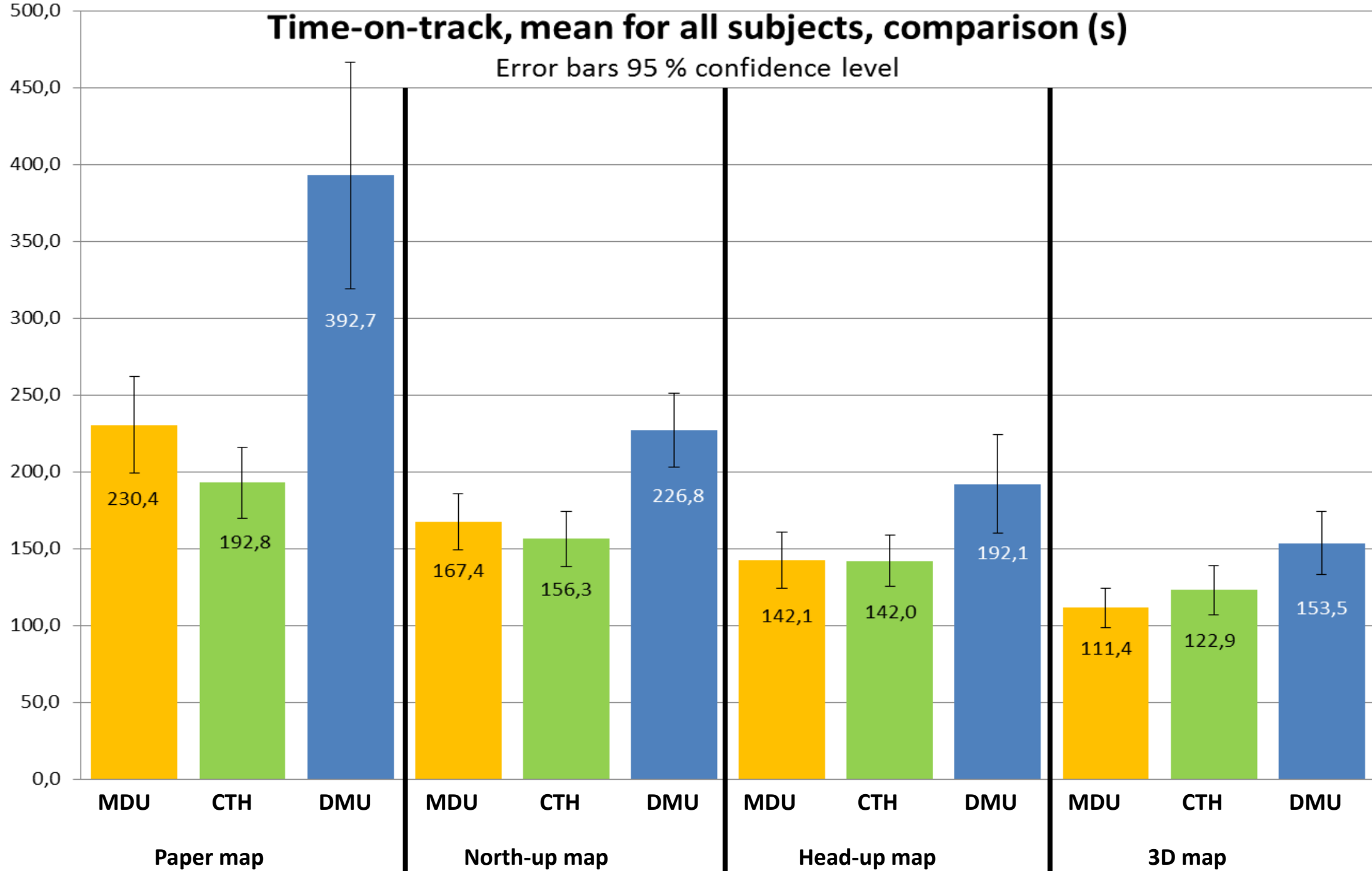
30 fourth year cadets from Dalian
Maritime University



Independent variables	Dependent variables
Map types (Paper, North-up, Head-up, 3-D)	Time on track
Gender	Number of groundings
Age	Subjective ranking of user-friendliness
Navigational experience	Score on figure rotation test
Self taxed sense of direction	

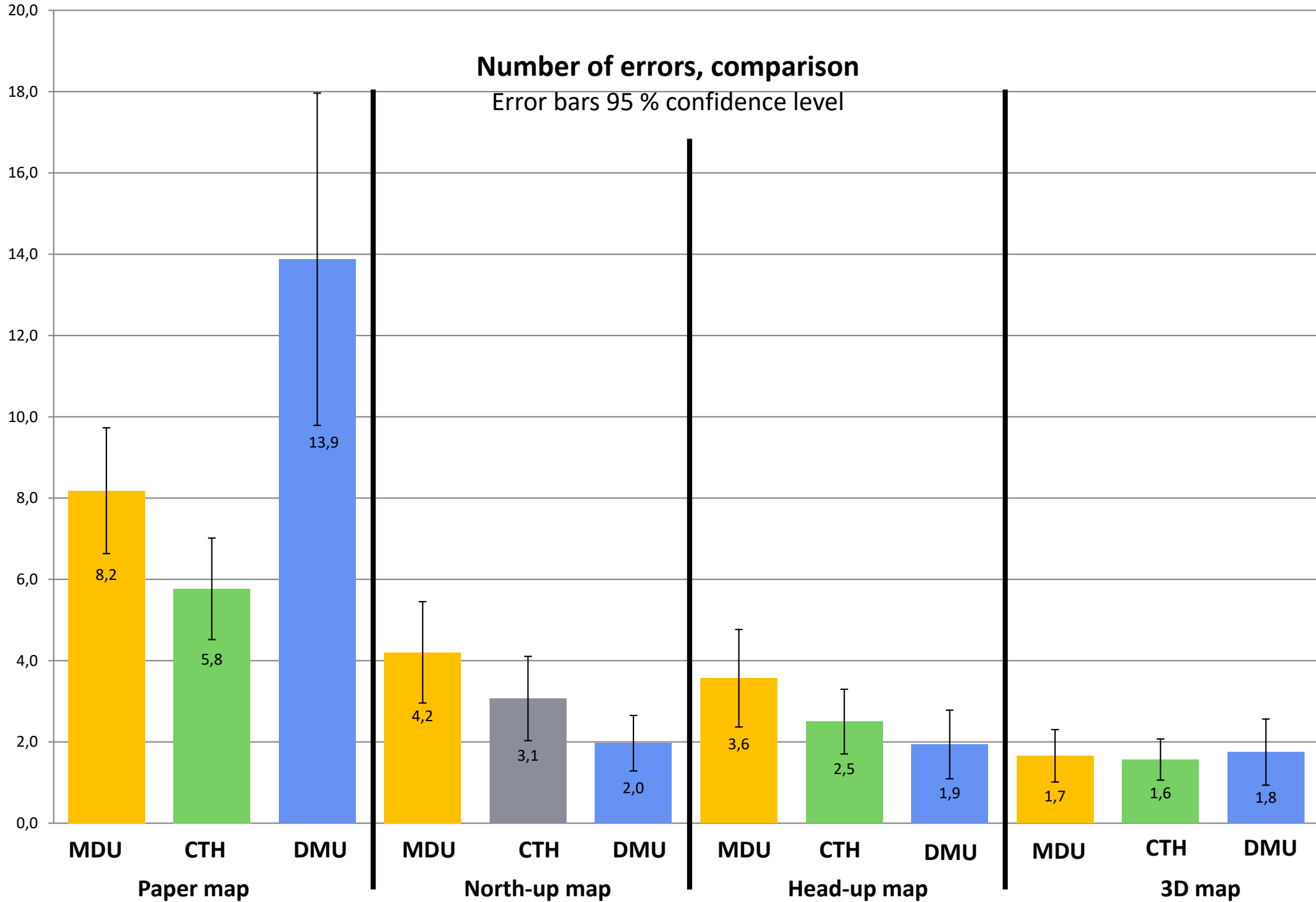
Time-on-track, mean for all subjects, comparison (s)

Error bars 95 % confidence level

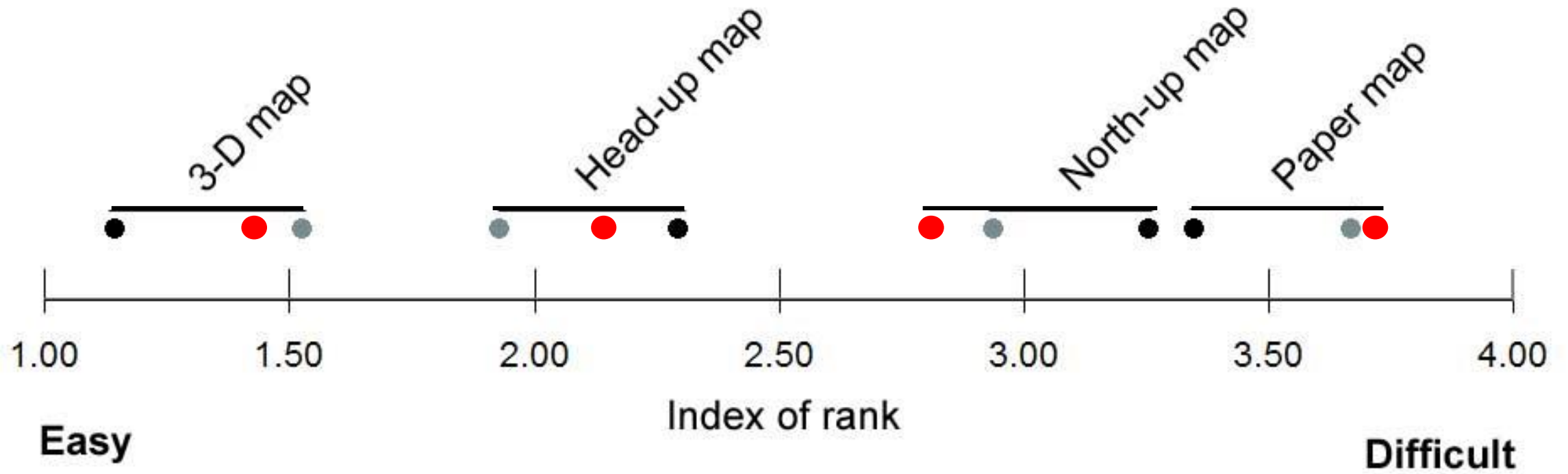


Number of errors, comparison

Error bars 95 % confidence level



Perceived user-friendliness



- Mälardalen University
- Chalmers University of Technology
- Dalian Maritime University



Prosjekt

”Sikker kurs” 2017-

Geomatics Norway AS

 NTNU

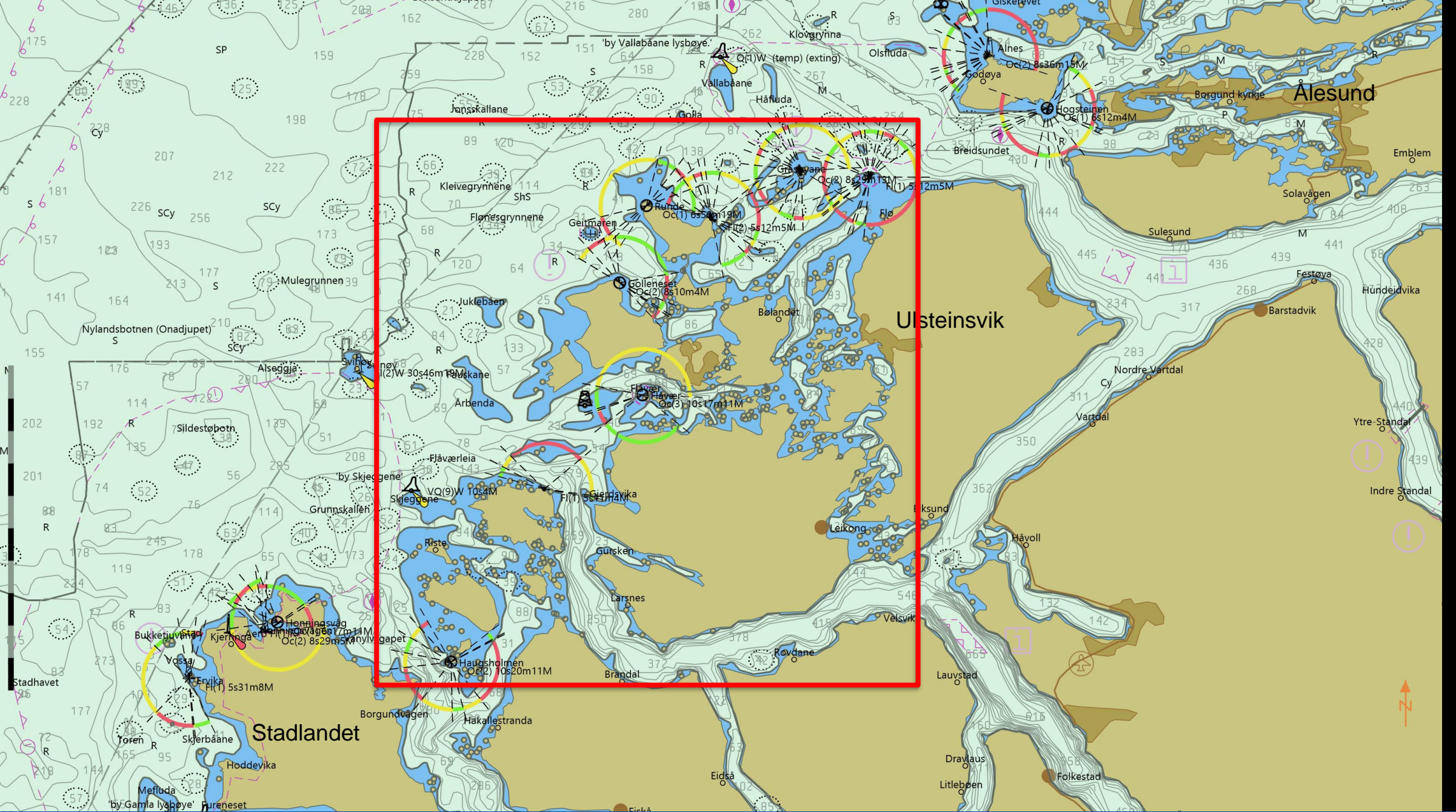
COMBITECH



KYSTVERKET



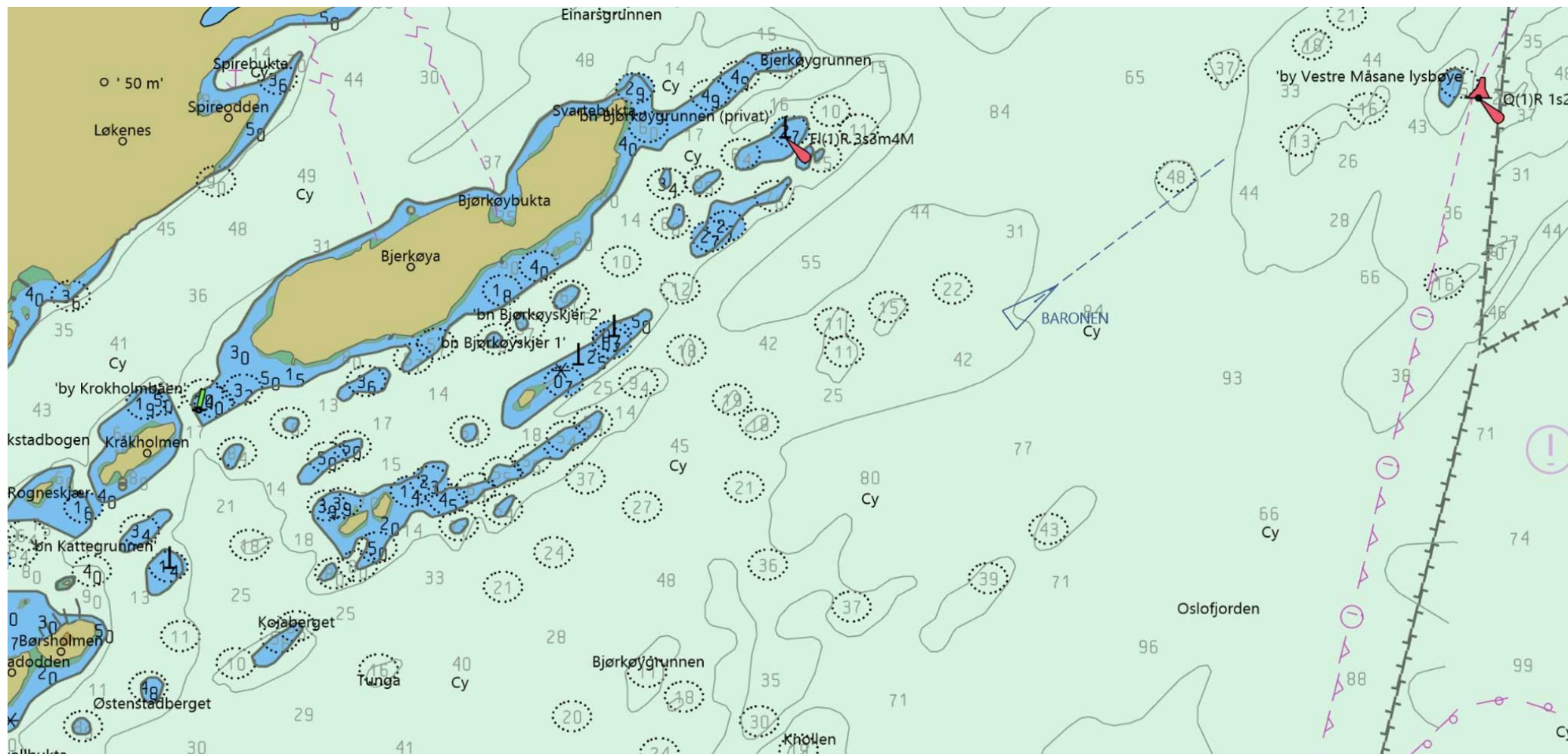
Sikker kurs
konseptbilde
Porathe



Brukergruppen i Ulsteinvik 19 januar 2017: deltagere fra småbåtslag i Sør Sunnmøre



NoGo område

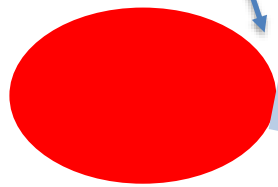


NoGo område



Grunnstøtingslarm 30 sek. (konfigurerbar tid, automatisk utkobling ved lav fart)

Snitt trigger alarm



Dybdekurva

Kurs-fart-vektor

Lengde = hastighet x tid
 $0,25 \text{ M (463 m)} = 30 \text{ kn.} \times 30 \text{ sek.}$

Konfigurerbar bredde

Eget fartøy

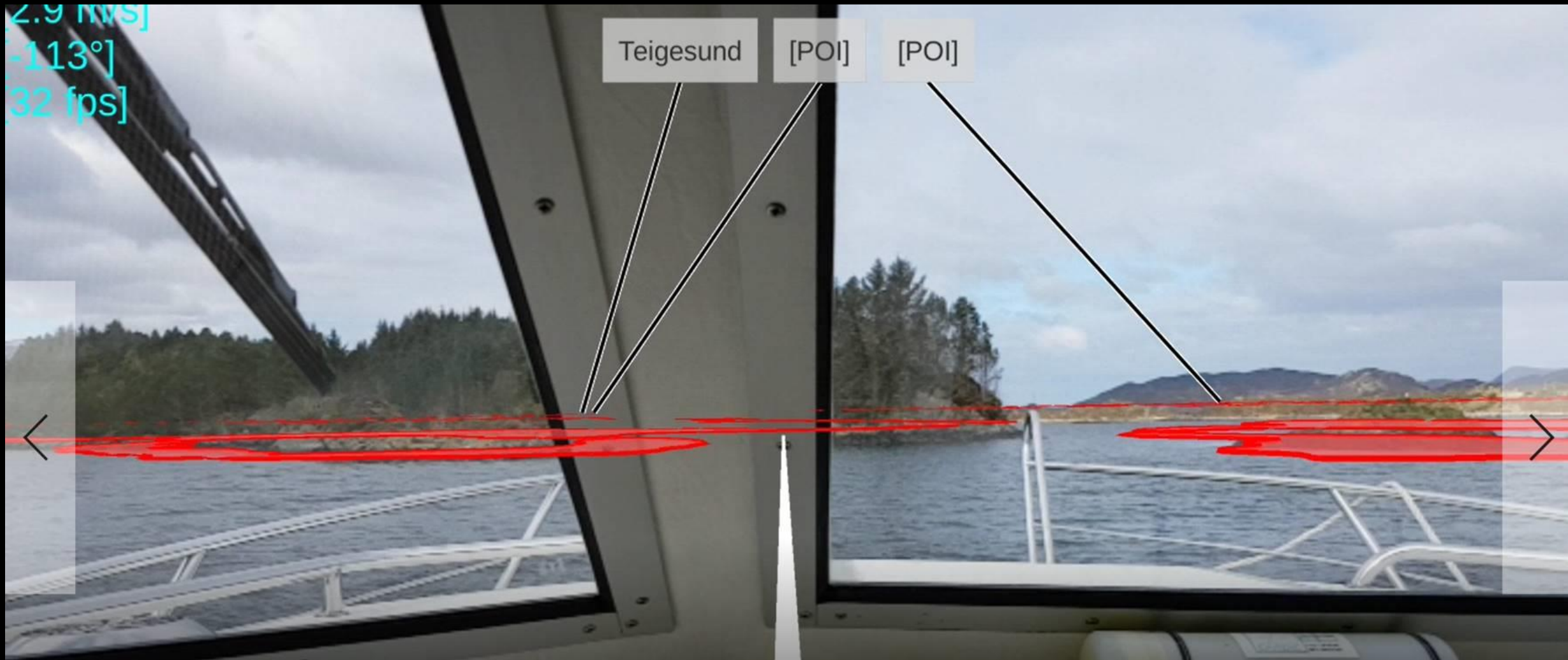


GV9

22,4 knop
30 sek.
= 347 m

Frå vestre
Samsung
Galaxy s7
med ekstern
GPS og
Nokia 7 Plus

Mot
Boholmen på
Osneset,
Ulsteinvik







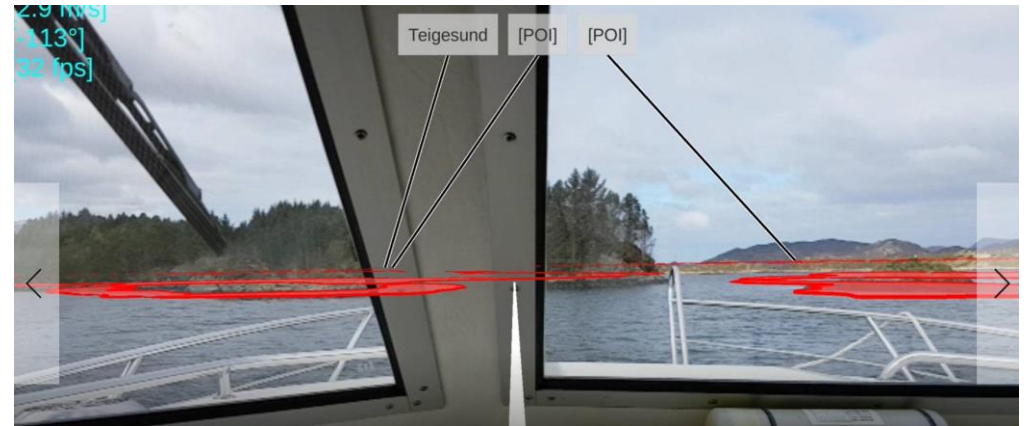
Lydalarm



Föraren
stopper
båten



2.



1.

Telefonen varslar i "avstängt" läge

Varför? Appen visar djup mindre än 3 meter som röda polygoner



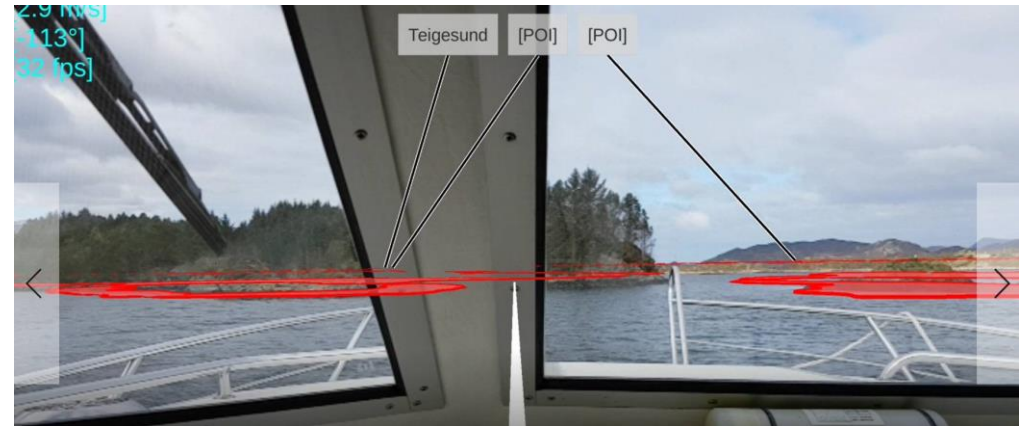
Telefonen varslar i "avstängt" läge



~~Föraren stopper båten~~



Båten går automatiskt ner i låg fart



Appen visar djup mindre än 3 meter som röda polygoner

