

carolyn friedlander

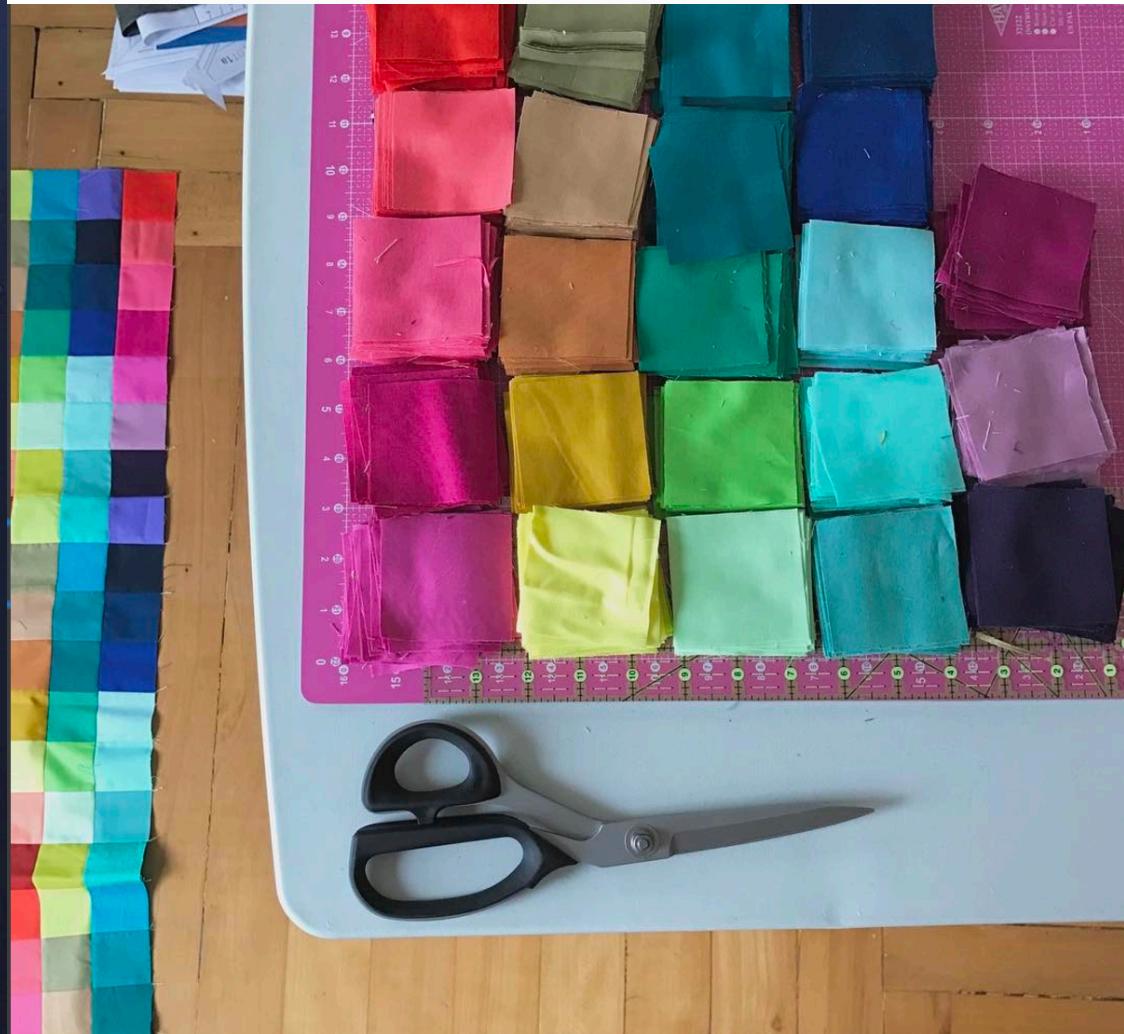


AMERICAN
PATCHWORK &
quilting
Flying Geese
Challenge

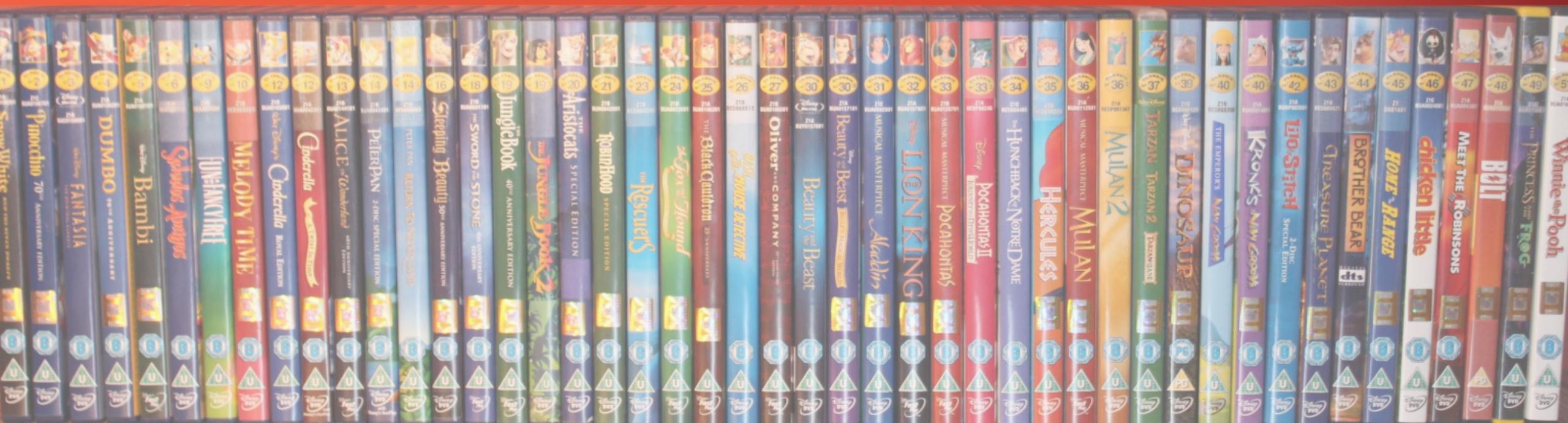
QUILTCON
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QUILTCON

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PASADENA, CA | FEB 22-25, 2018



Creating Content From Video Collections



Mackenzie Leake

Group Meeting
November 9, 2017



What I've been up to...



What I've been up to...



Working with Oliver Wang (Seattle) & Anh Truong (SF)

What I've been up to...

1. [proof of concept] Producing videos frame-by-frame
2. [in progress] Navigation using 360-videos
3. [to do] Detecting continuity errors

What ties these seemingly different applications together?

“Walking Across America”



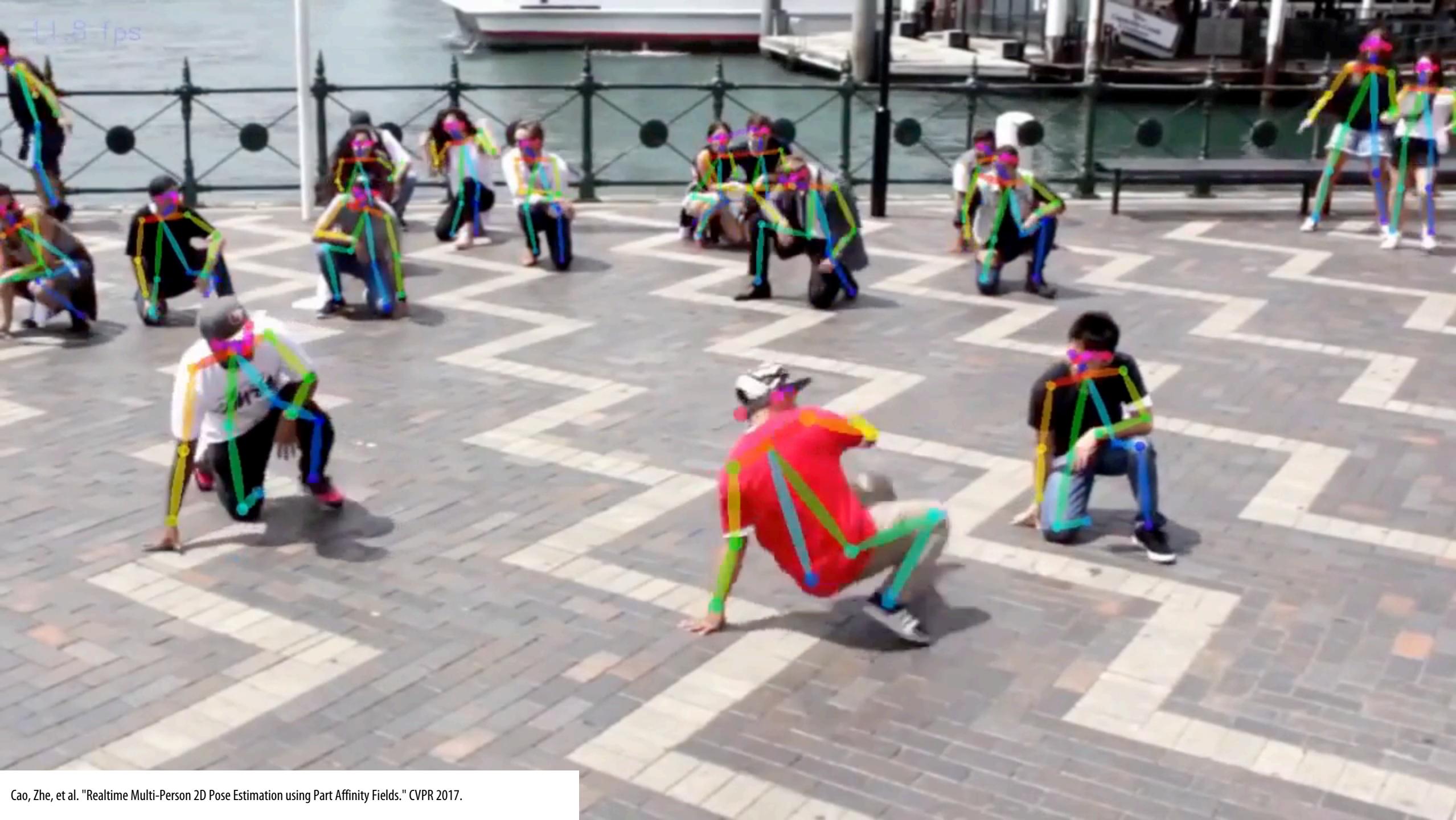
Levi's Jeans. "Guy Walks Across America." 2011.

Levi's "Guy Walks Across America" Behind The Scenes



“Walking Across America”

- Problems
 - Cutting frame by frame is extremely labor-intensive
 - Keeping motion continuous is difficult without careful planning
- Technical solution
 - Use pose tracking to maintain motion



11.8 fps



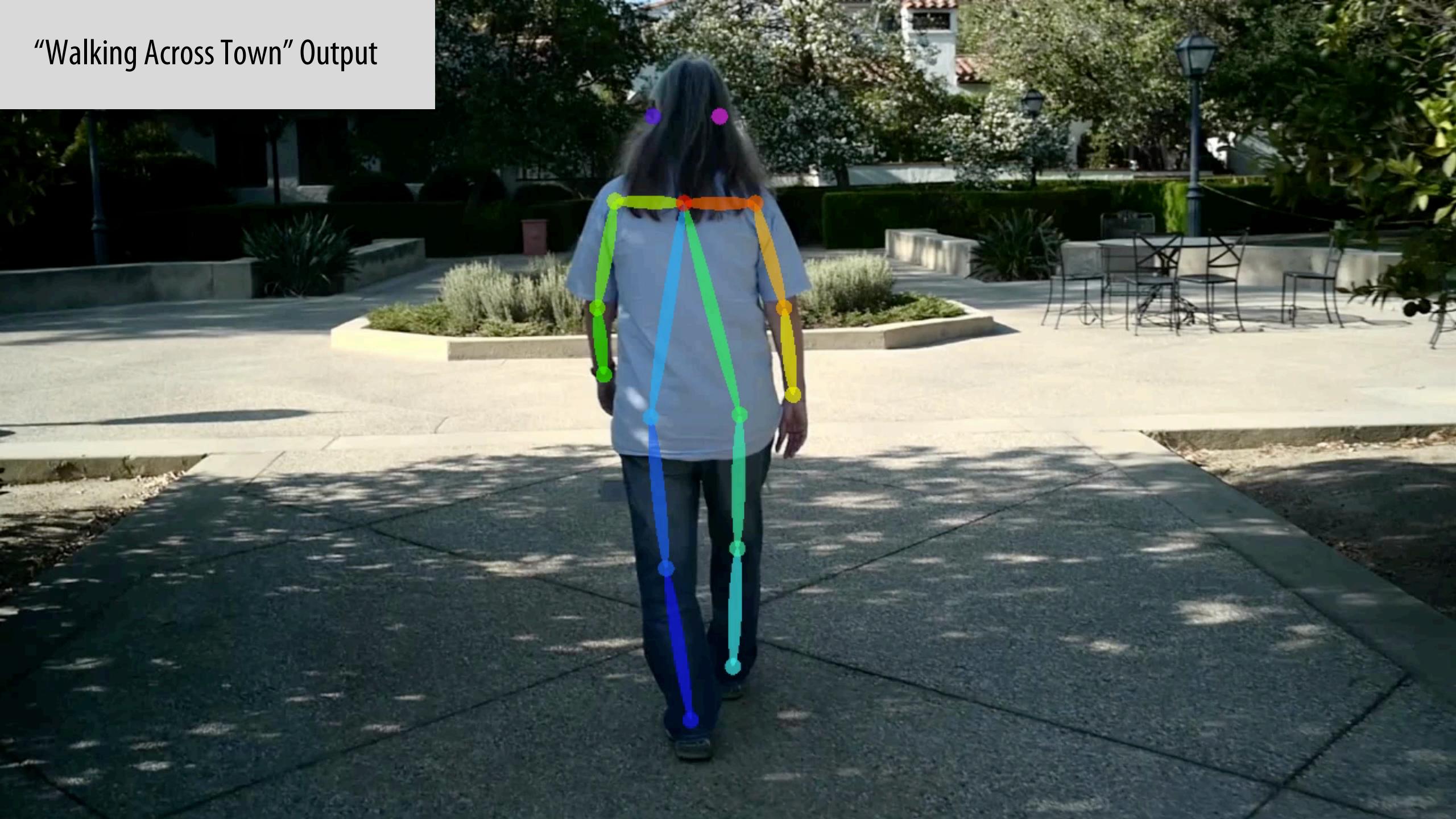
“Walking Across Town” Inputs



Query



"Walking Across Town" Output



Navigation via 360 video

Navigation via video



Navigation via video



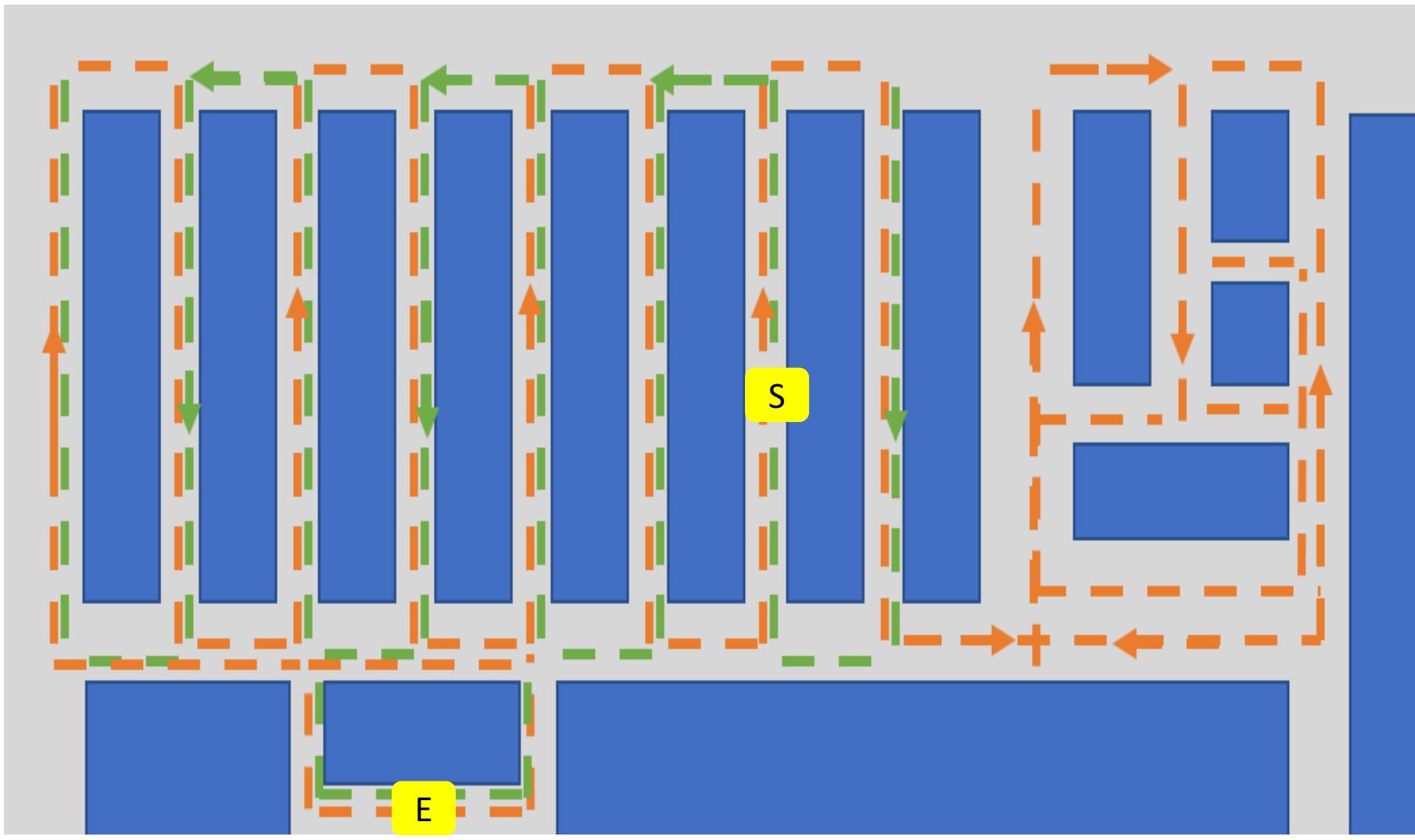
360 Video Navigation

- Problems
 - Mapping indoor environments without GPS can be difficult
 - Current solutions for mapping environments are compute-intensive
- Technical solution
 - Compute features that can serve as proxies for location
 - Use these features to traverse paths

Navigation Input

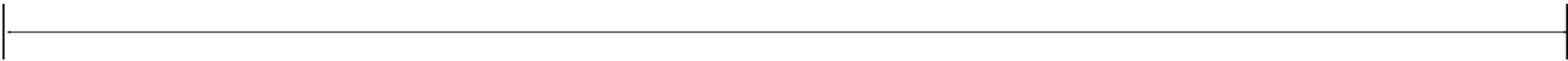


Task: Navigation

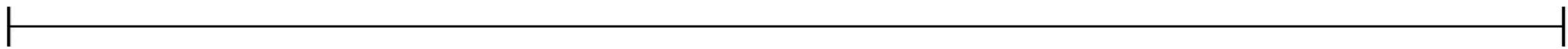


Grocery Store Layout

Navigation Output



Navigation Output



Continuity Checking

Continuity Checking



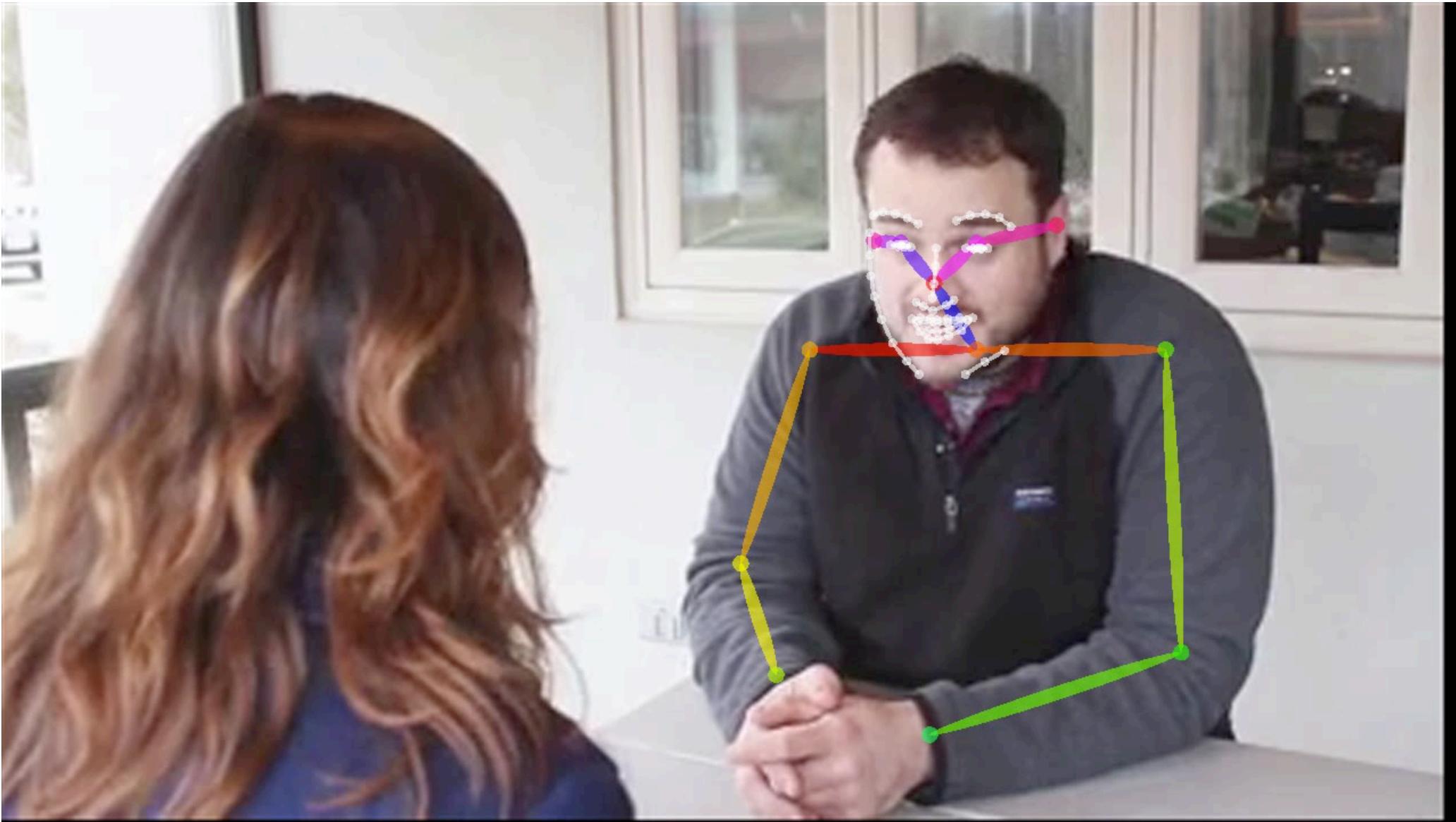
Fantastic Four
Arms behind ladies are instantly in front



Continuity Checking

- Problems
 - In some situations re-filming or re-editing to fix errors is costly, if not impossible
- Technical solution
 - Identify potential, common continuity errors using pose and other visual features
 - Placement of objects
 - Actor position
 - Etc.

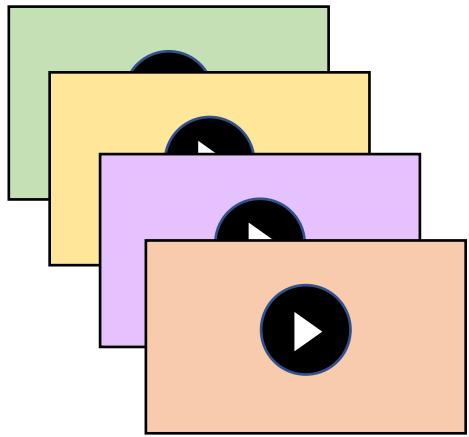
Continuity Checking



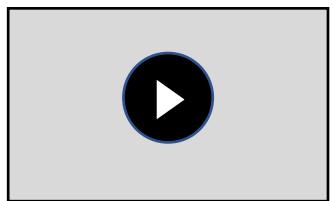
What unites these applications?

Video Pipeline

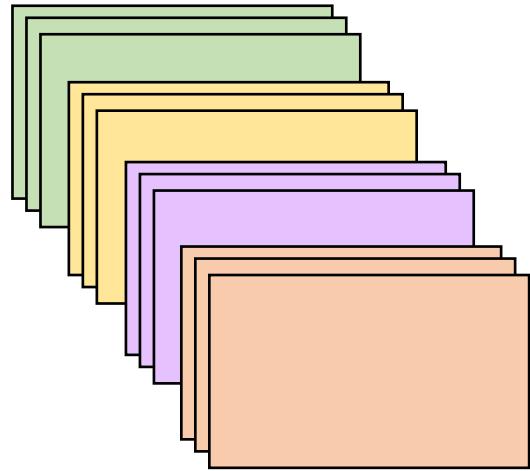
1. video collection



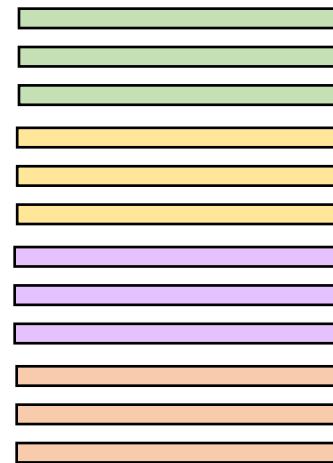
2. query video



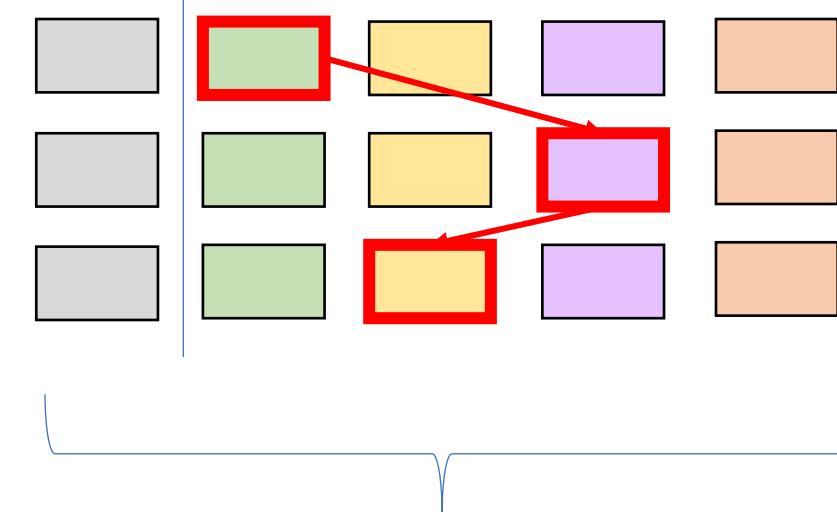
3. frames



4. features



5. graph

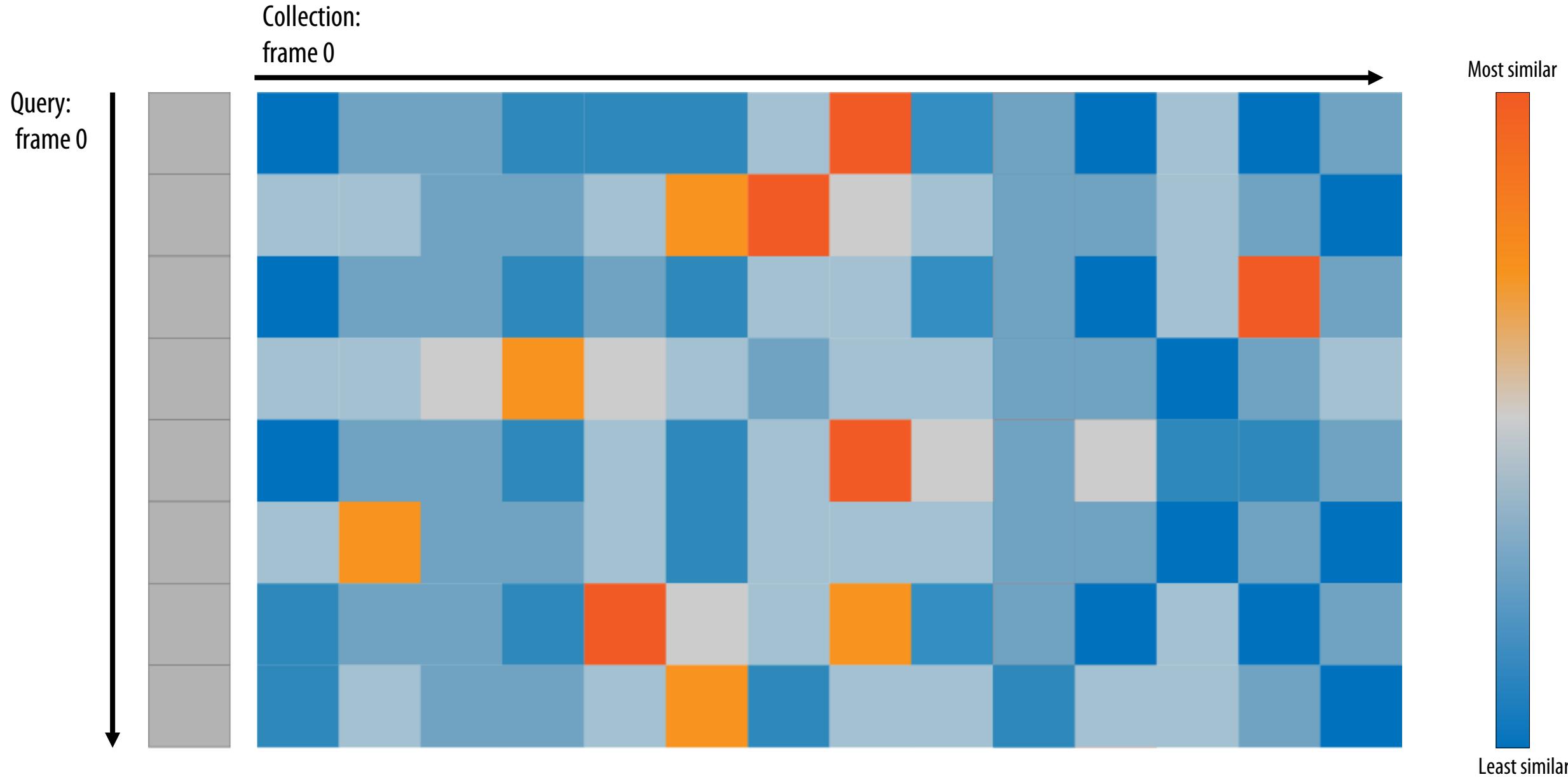


6. output video



“Walking Across America”

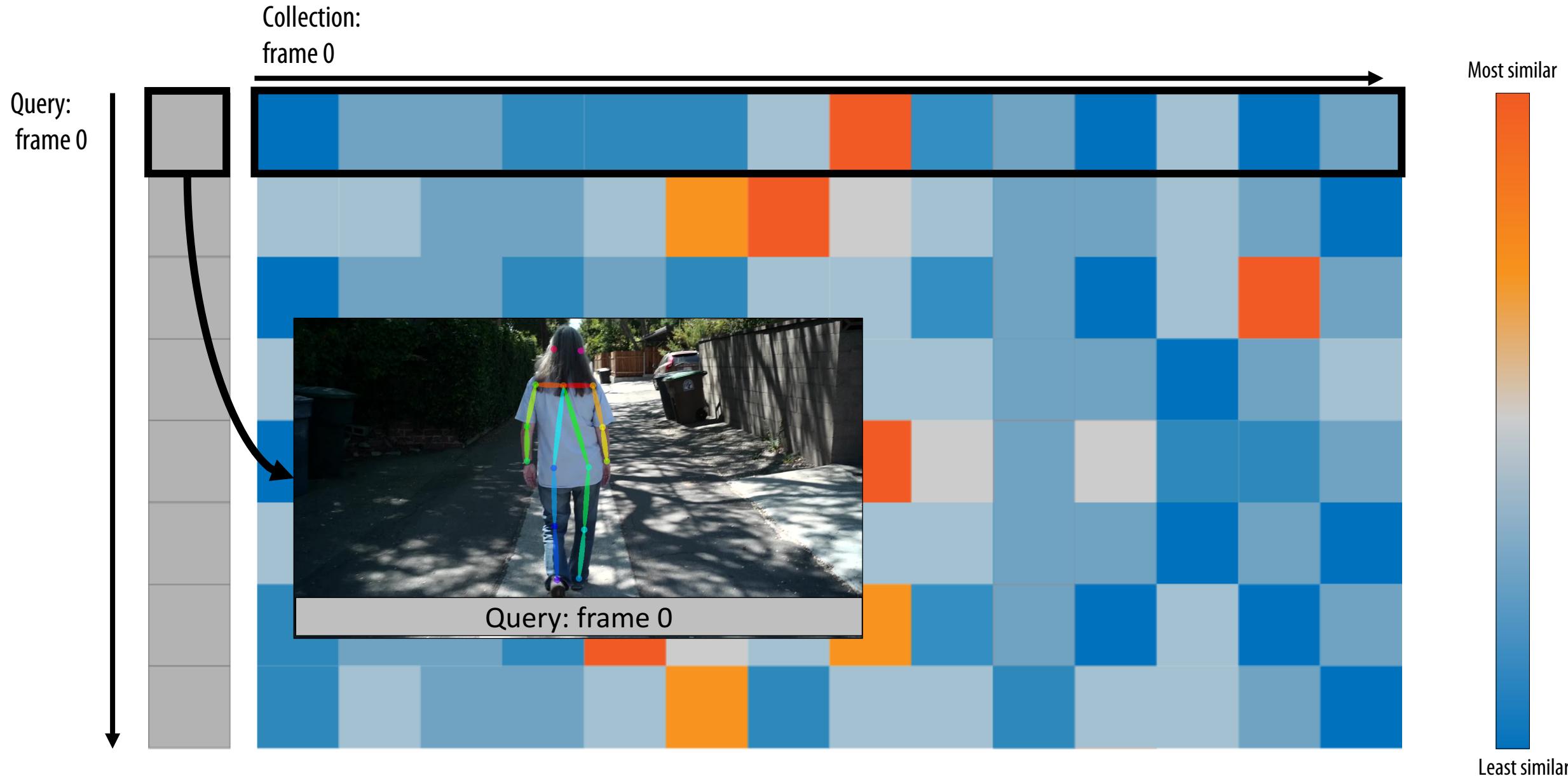
“Walking Across Town” Nearest Neighbor



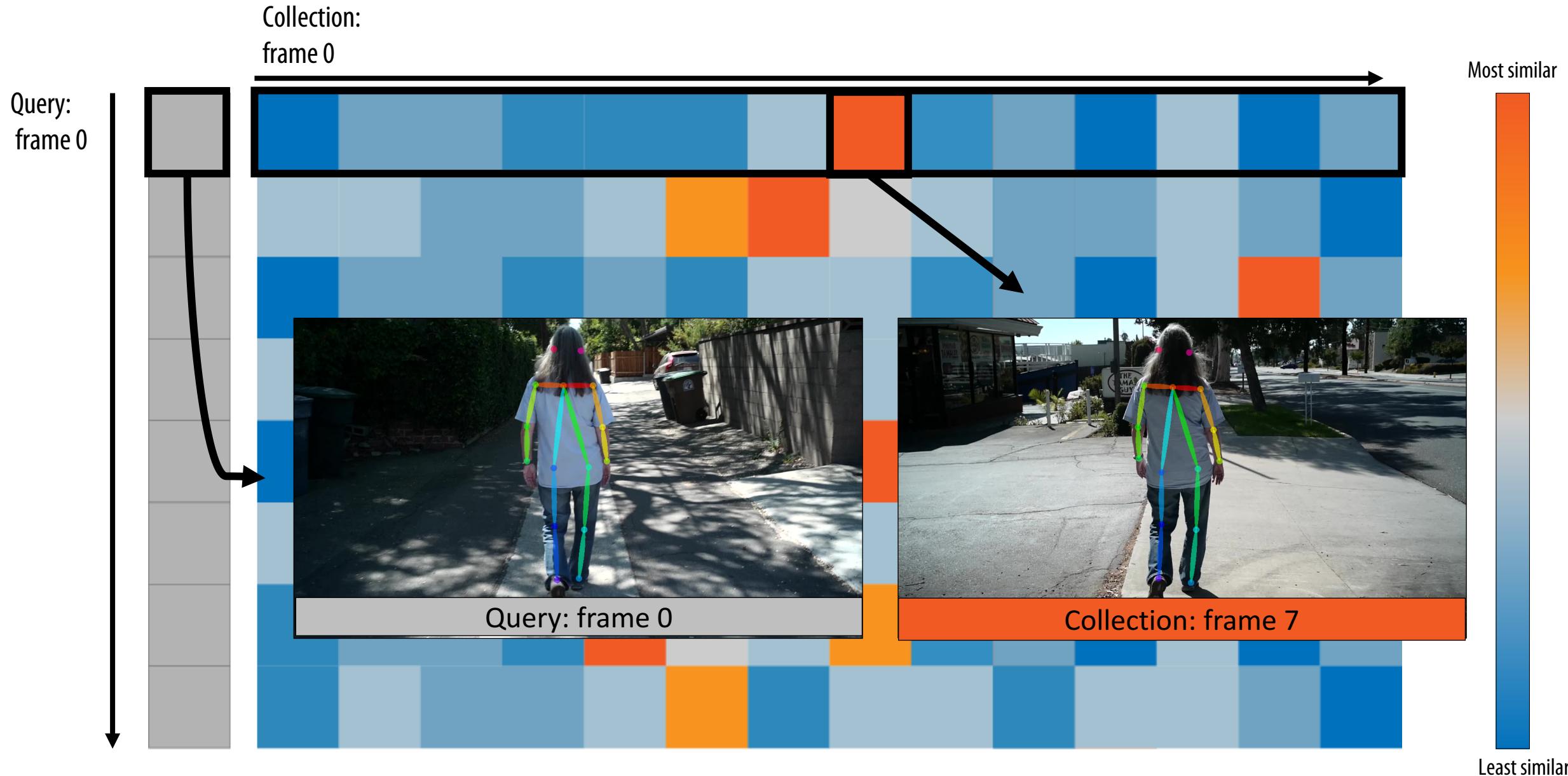
“Walking Across Town” Nearest Neighbor



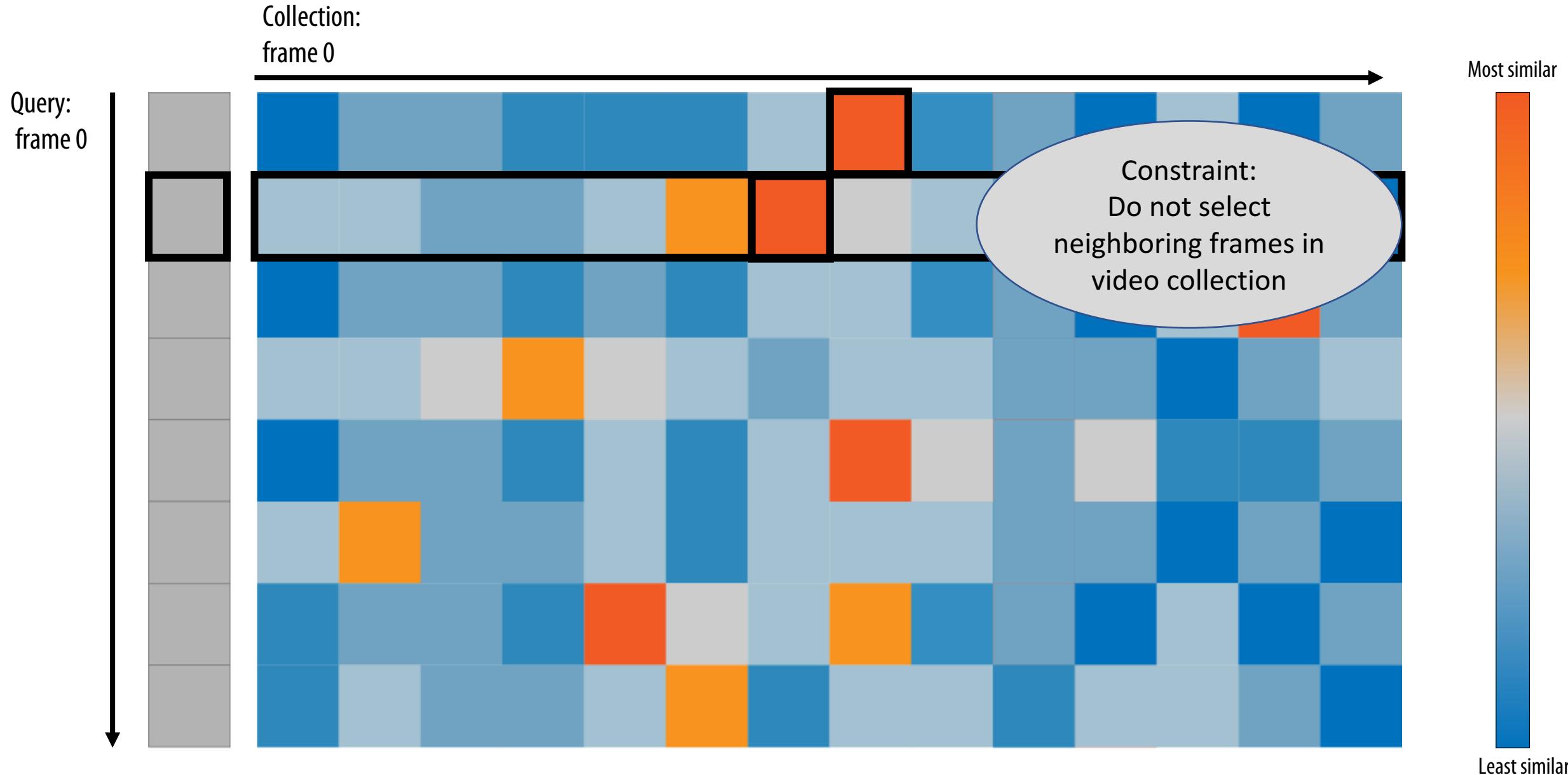
“Walking Across Town” Nearest Neighbor



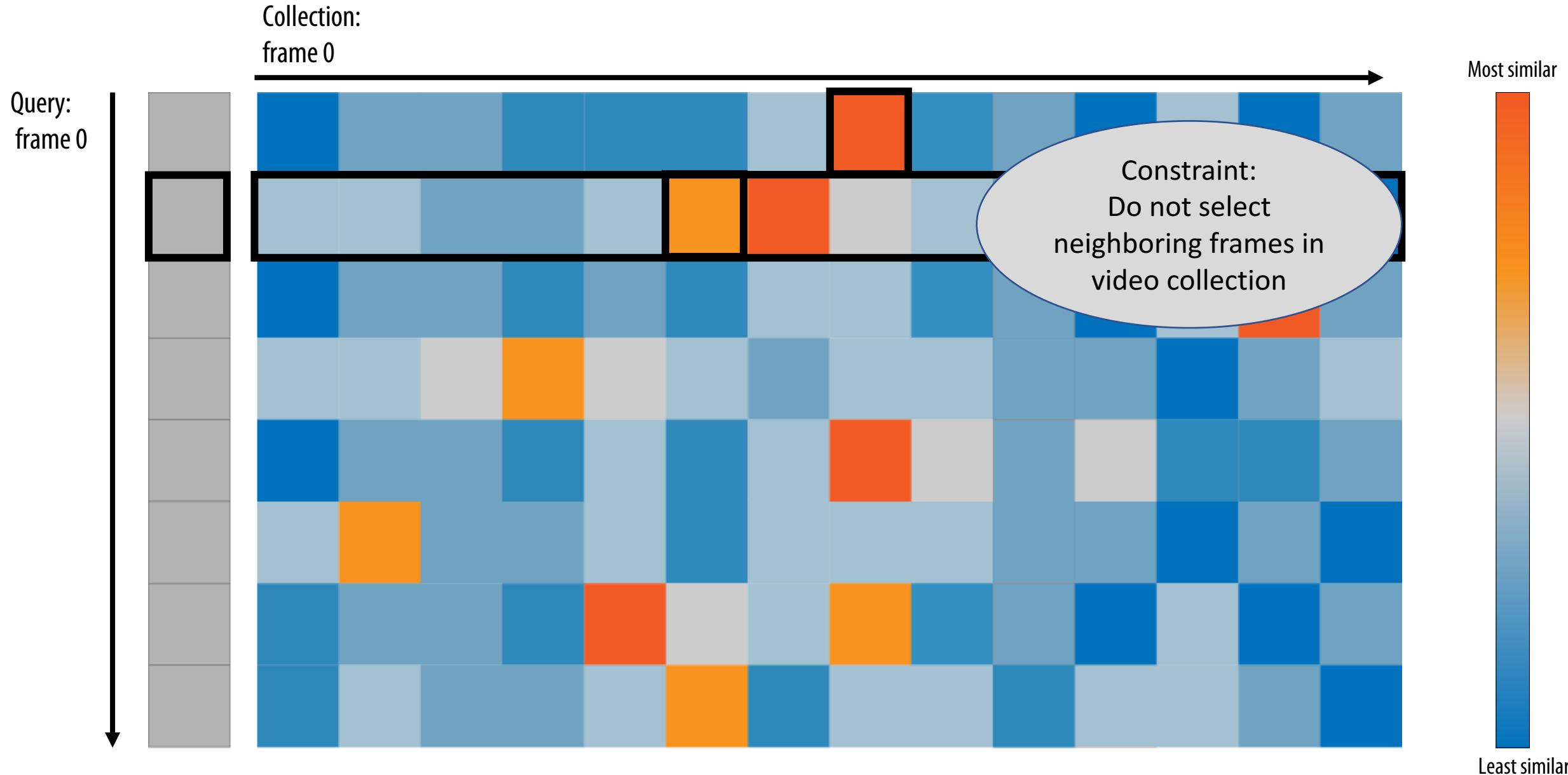
“Walking Across Town” Nearest Neighbor



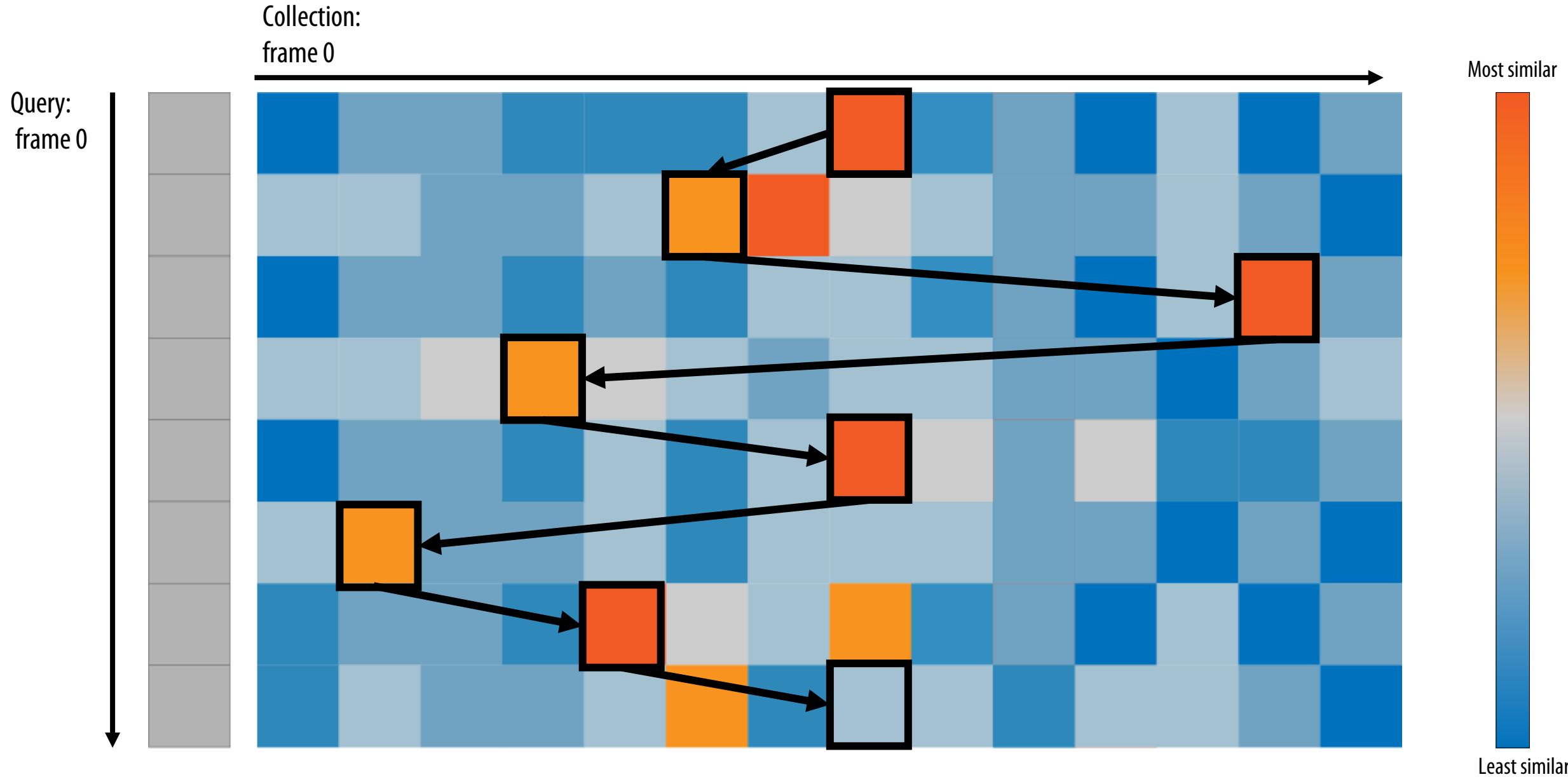
“Walking Across Town” Nearest Neighbor



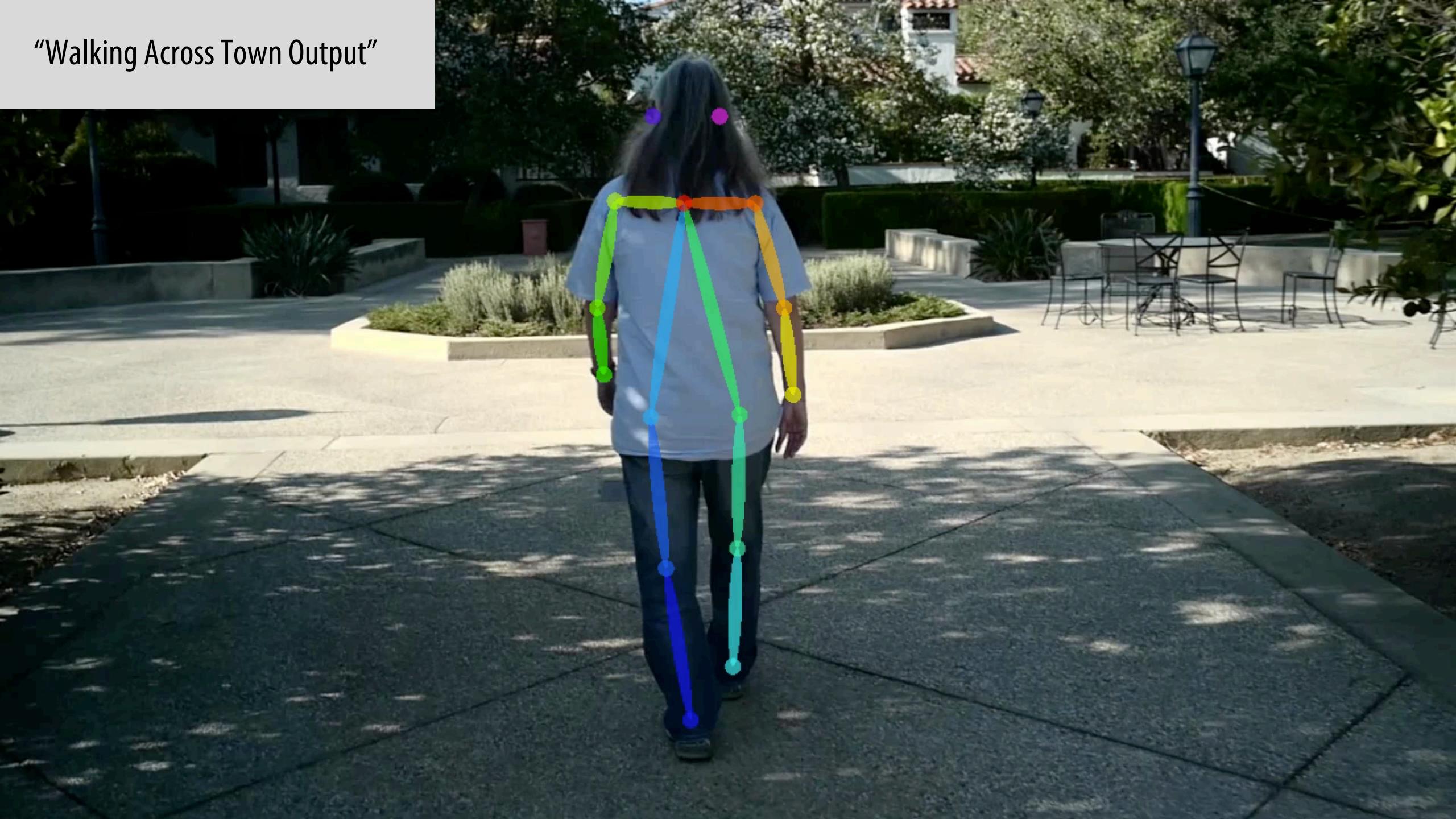
“Walking Across Town” Nearest Neighbor



“Walking Across Town” Nearest Neighbor



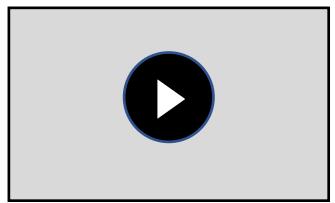
"Walking Across Town Output"



Navigation via 360 video

Video Pipeline

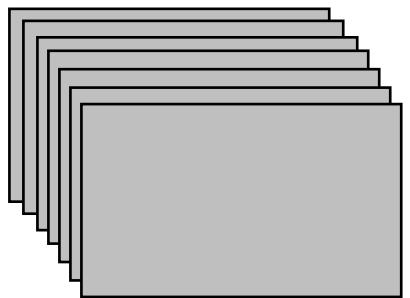
1. video collection



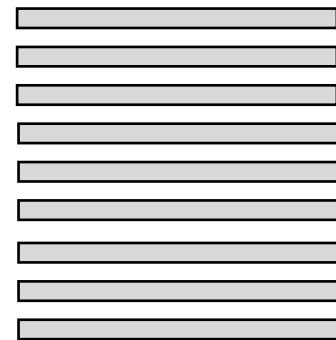
2. query video



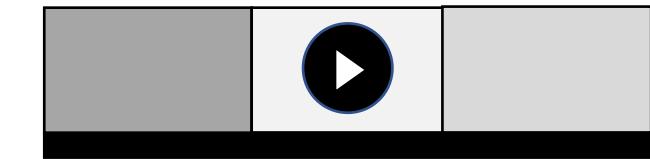
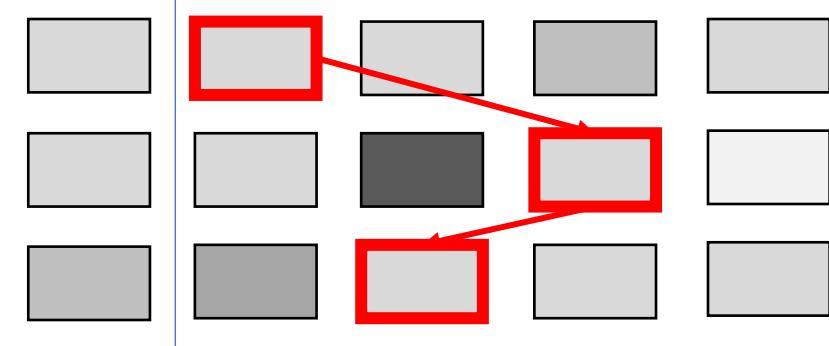
3. frames



4. features



5. graph



6. output video

Nearest Neighbors

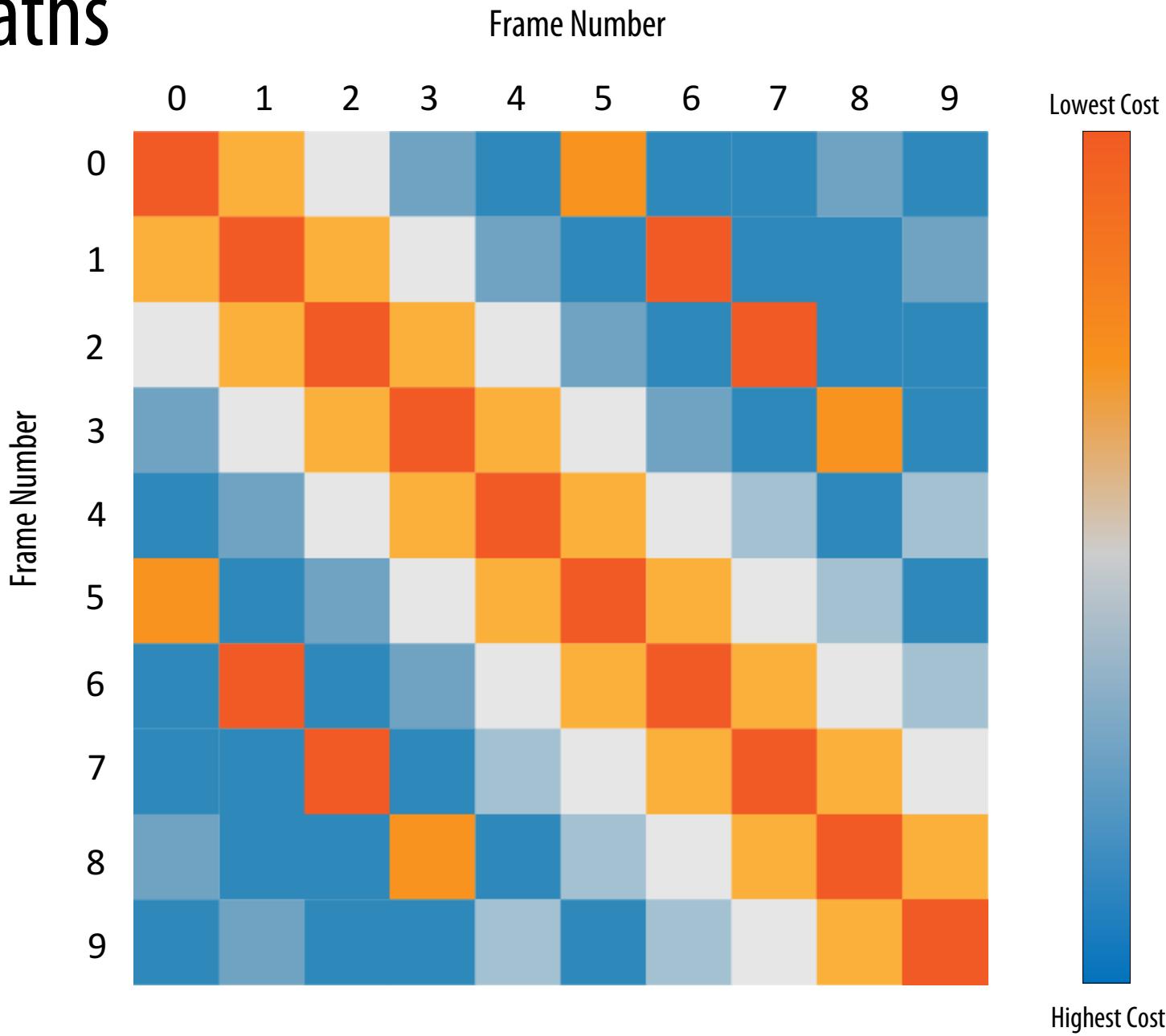


Query frame

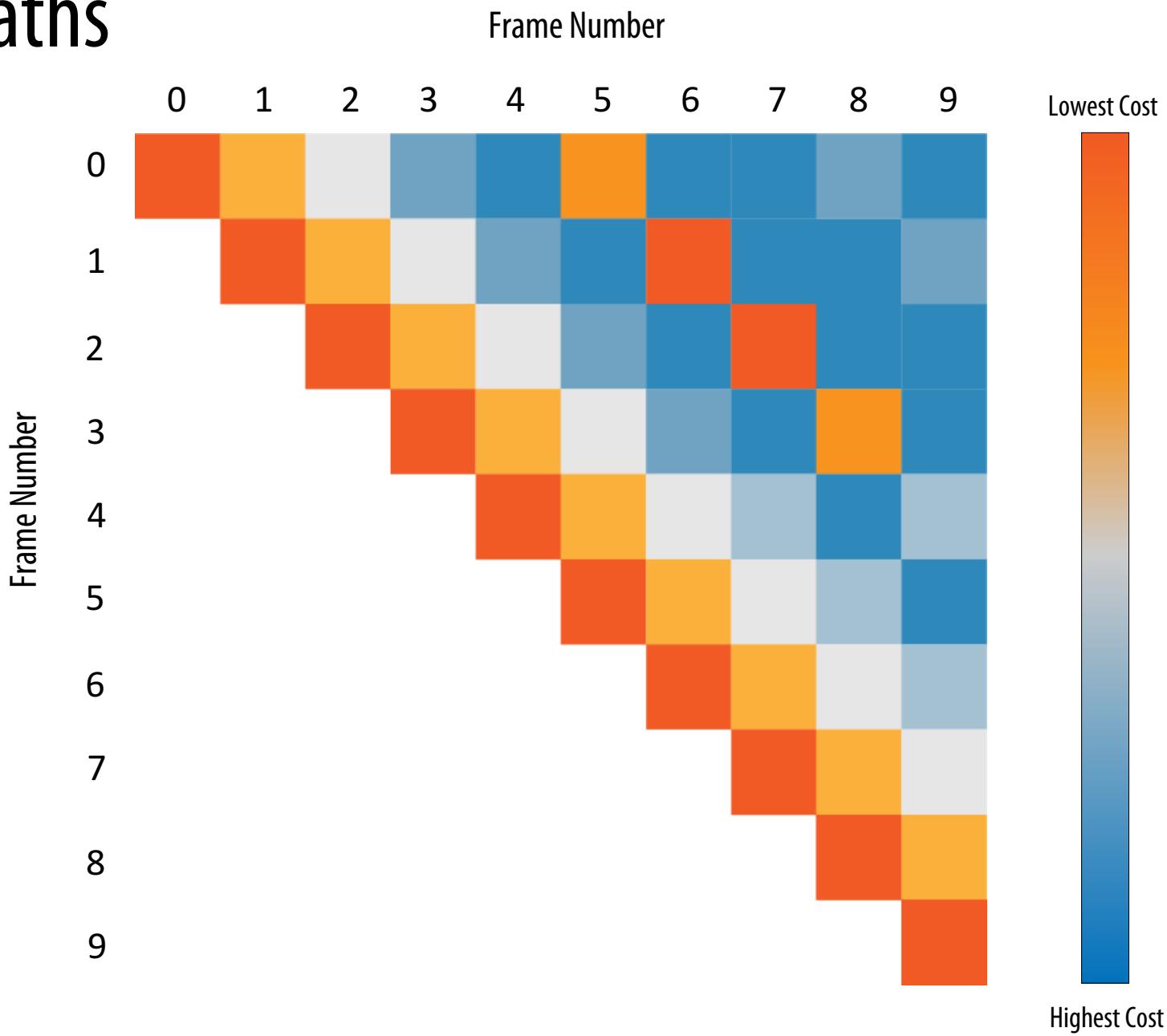


Potential neighbor

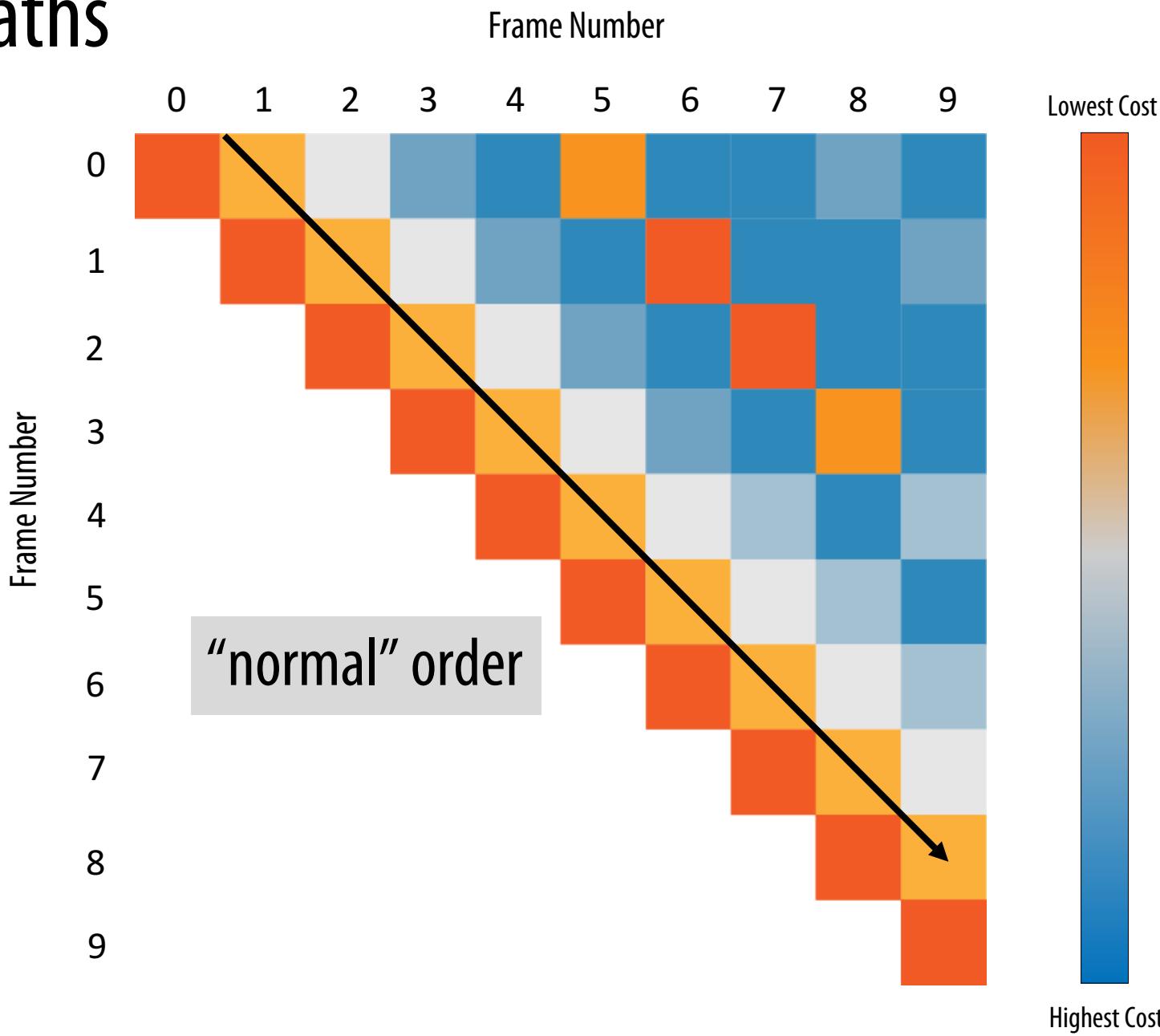
Evaluating Paths



Evaluating Paths



Evaluating Paths

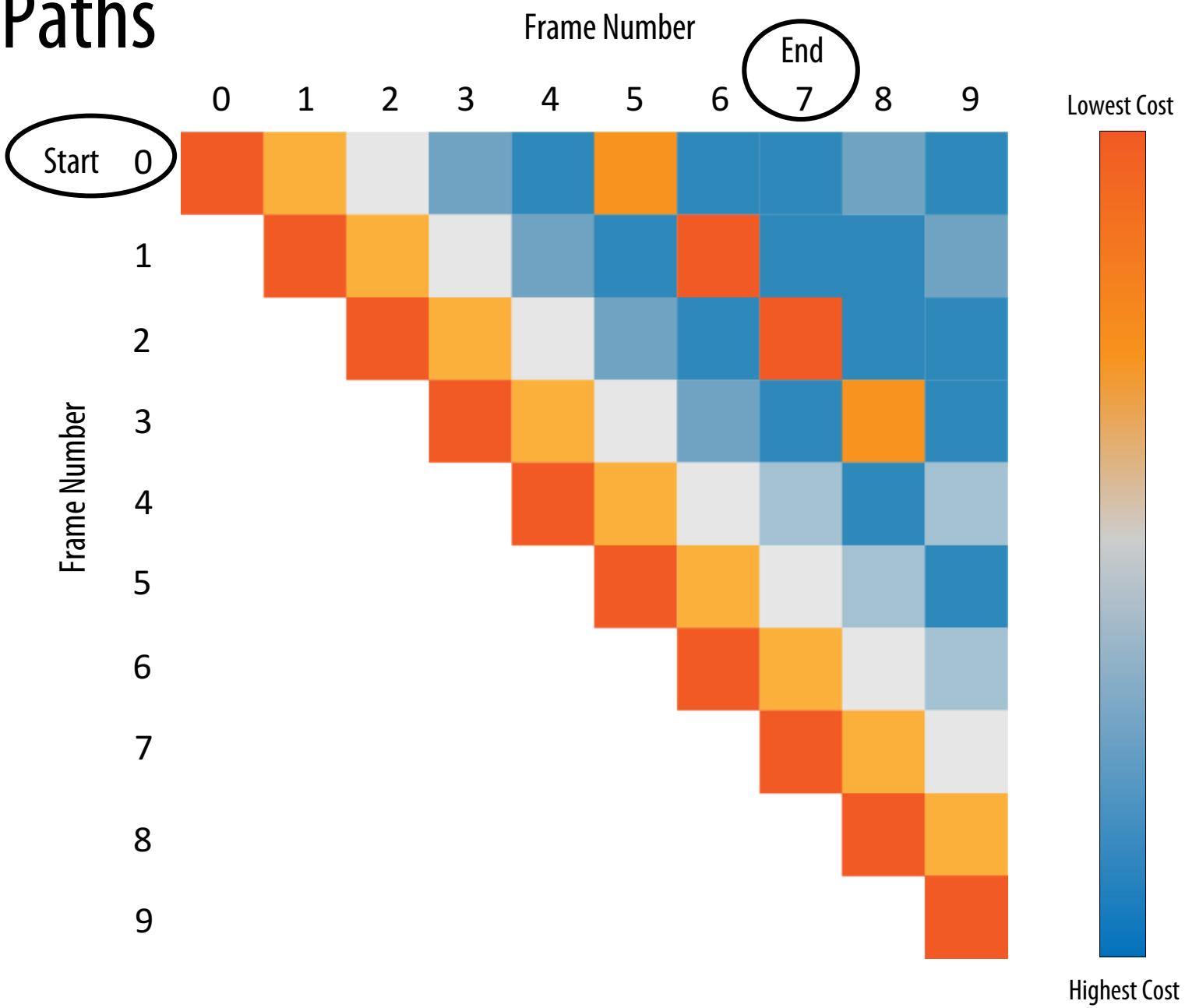


Evaluating Paths

Goal:

Start at frame 0

End at frame 7

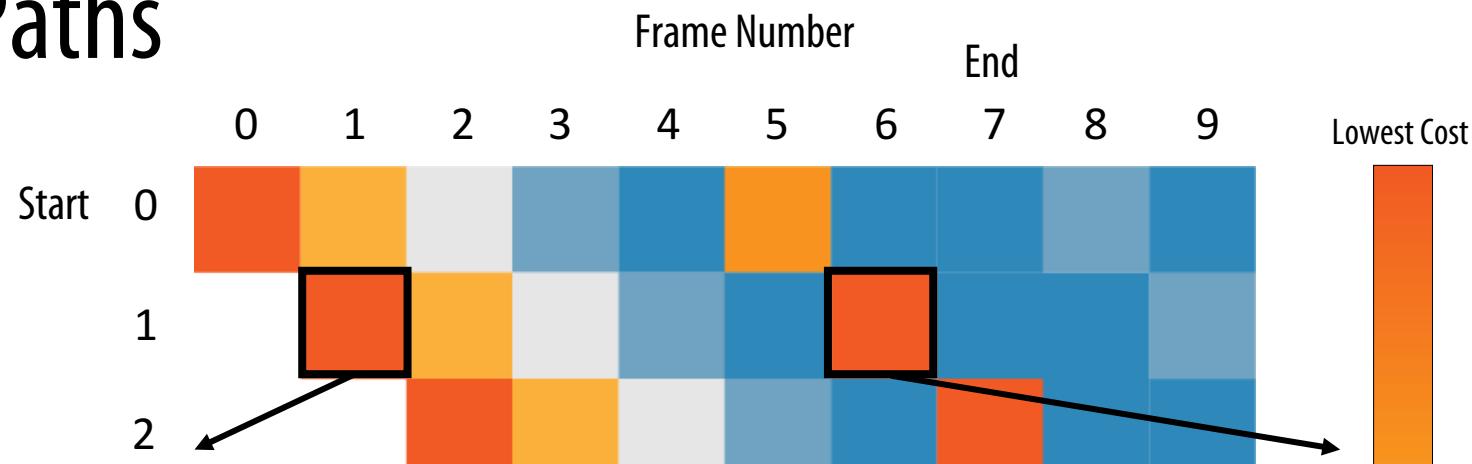


Evaluating Paths

Goal:

Start at frame 0

End at frame 7



Return to same location at later time

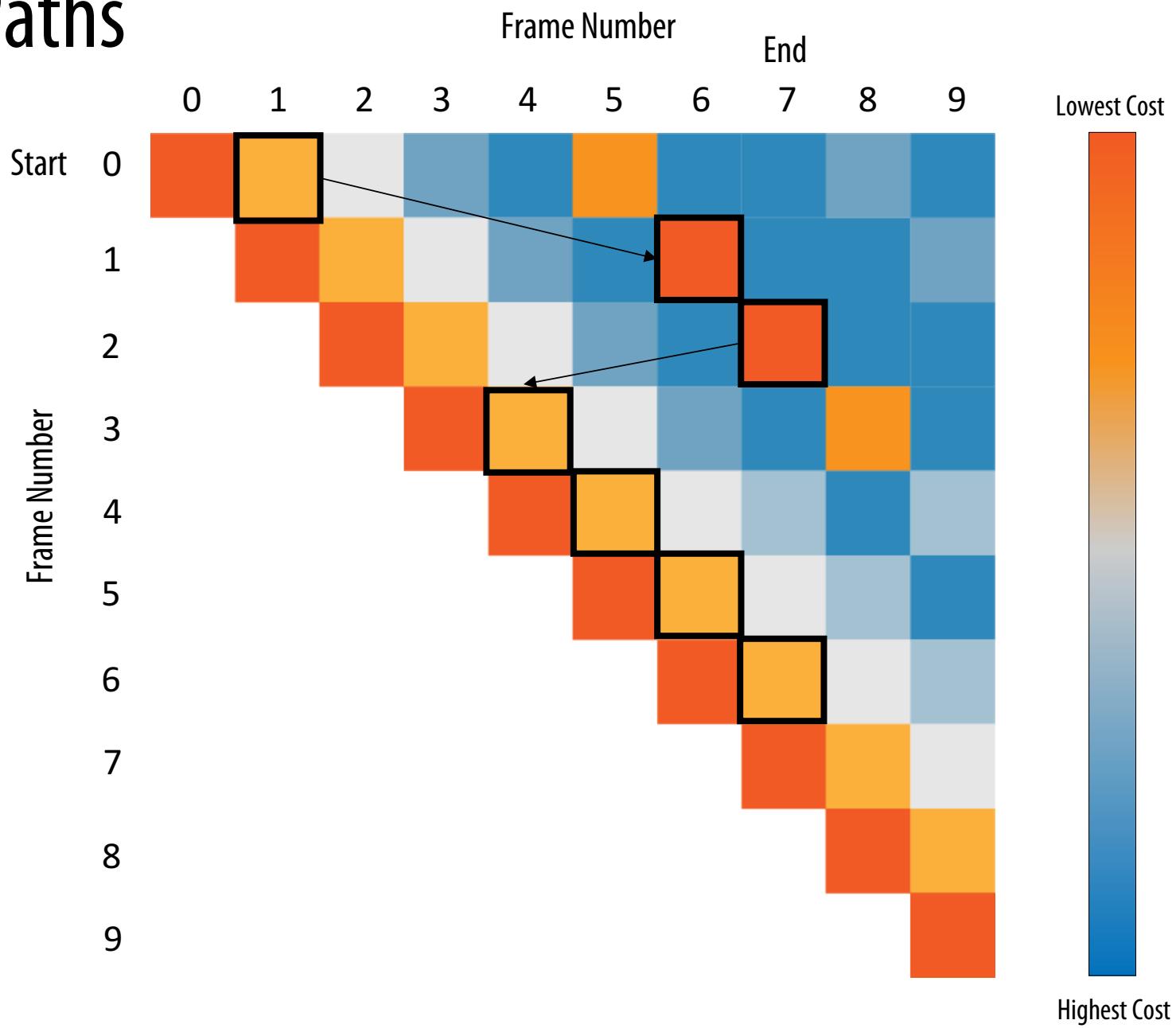
Highest Cost

Evaluating Paths

Goal:

Start at frame 0

End at frame 7

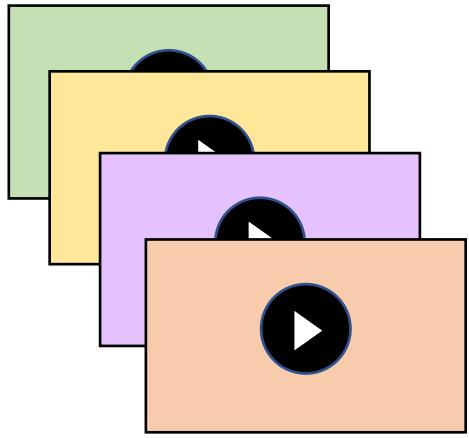


Navigation Output

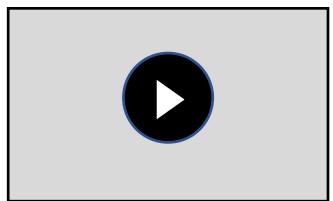


Video Pipeline

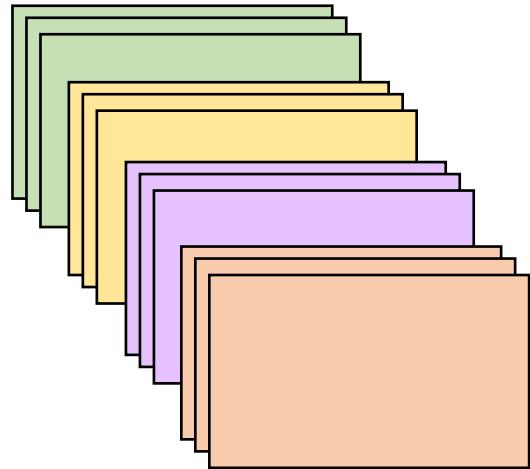
1. video collection



2. query video



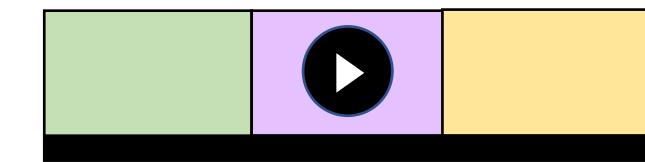
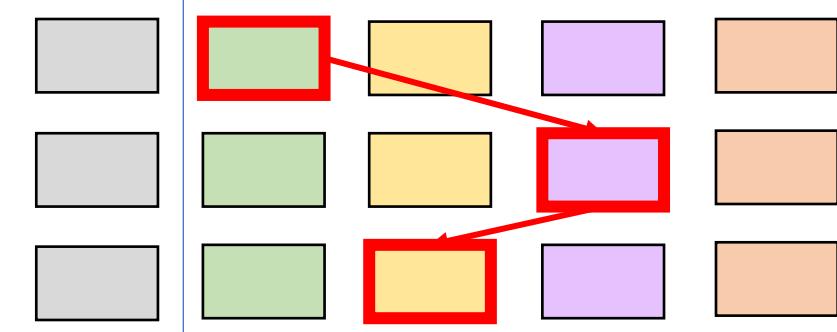
3. frames



4. features



5. graph



6. output video

Other Applications

- Visualizing action sequences



Baseball visualization from:

<https://www.sbnation.com/mlb/2013/4/25/4265286/five-yu-darvish-pitches-gif-texas-rangers>

Other Applications

- Visualizing action sequences
- Control playback of videos by pose
 - Sports/action videos



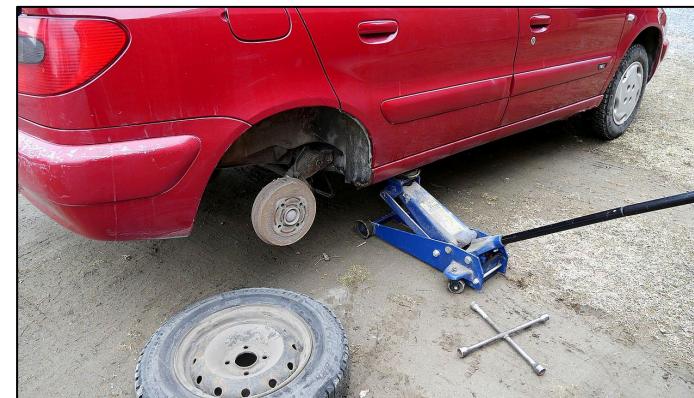
Webcam Video



Pro Golf Tutorial

Other Applications

- Visualizing action sequences
- Control playback of videos by pose
 - Sports/action videos
 - How-to-videos



Different perspectives on a specific step of changing a flat tire

Other Applications...

Thoughts/Questions?

Evaluating Paths

