

ORIENTEERING IN HYPERBOLIC GEOMETRY

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MOTIVATING QUESTIONS

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Is human search on hyperbolic space different than on Euclidean?

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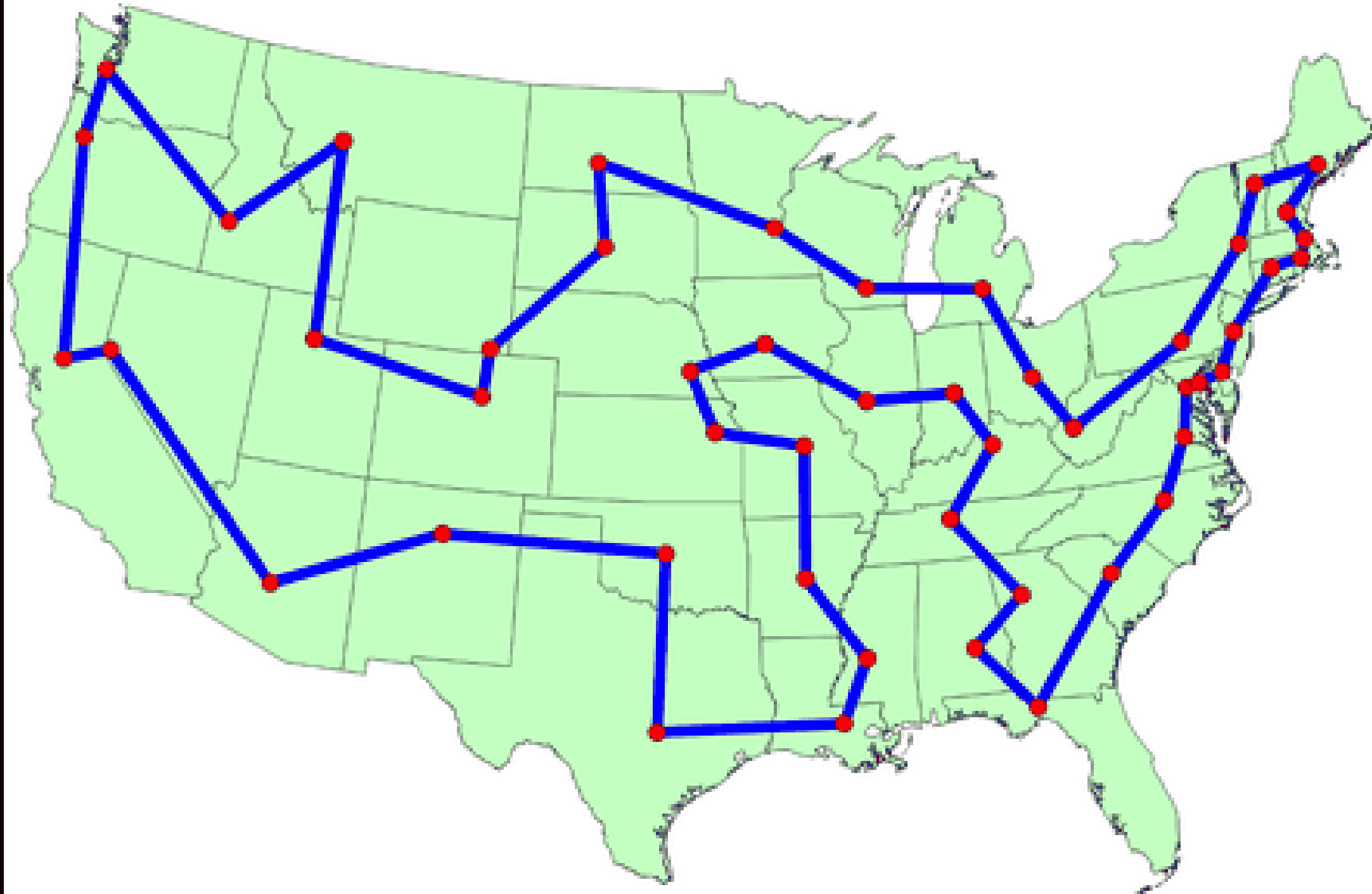
What heuristics do people take?

What computational heuristics perform Human like?

How does Human behavior compare to optimal solutions?

ORIENTEERING





Submit your levels at:

<http://goo.gl/forms/c6dZAhZTNb>

Creator: Me

Name: Pit of Panga: P Break

8:58:44.71

No mic because of roommates

0000000000 6500

Same capture card. Screen capture

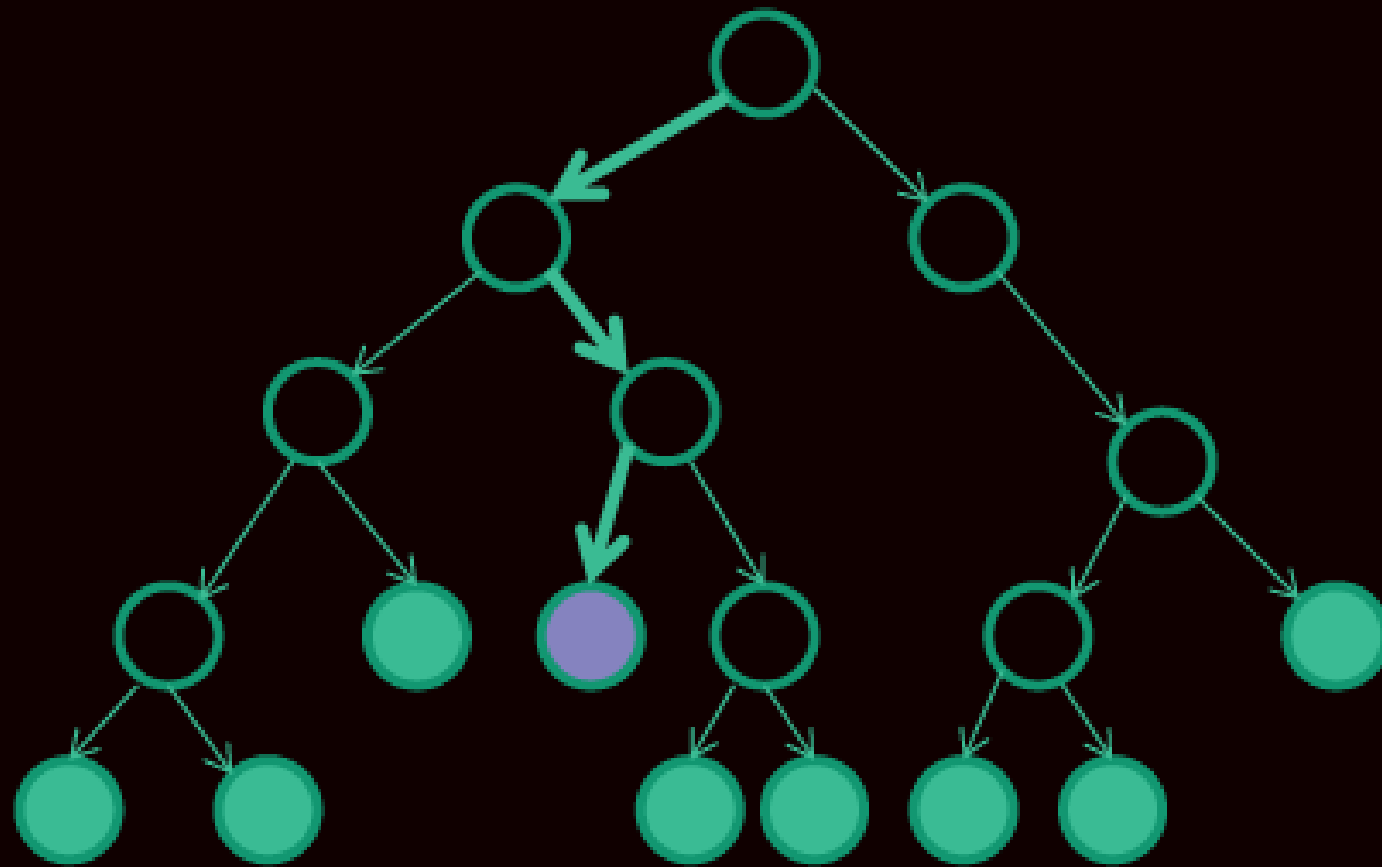


Latest Follower: MoG MoNeY

Nintendo Network ID: PangaeaPang



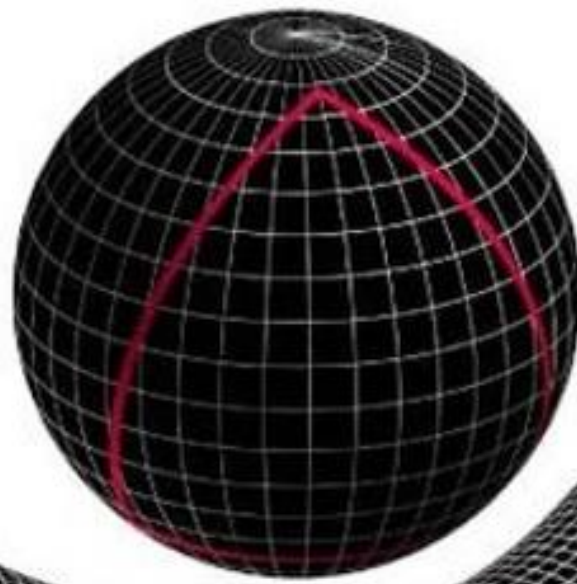
Branch-and-Bound



Each node in branch-and-bound is a new MIP

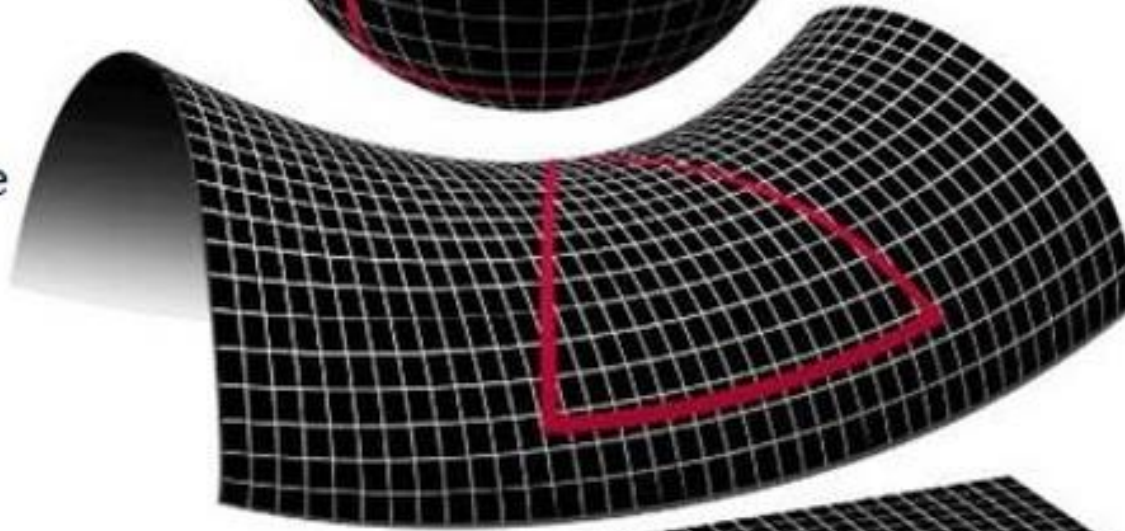
HYPERBOLIC GEOMETRY

positive



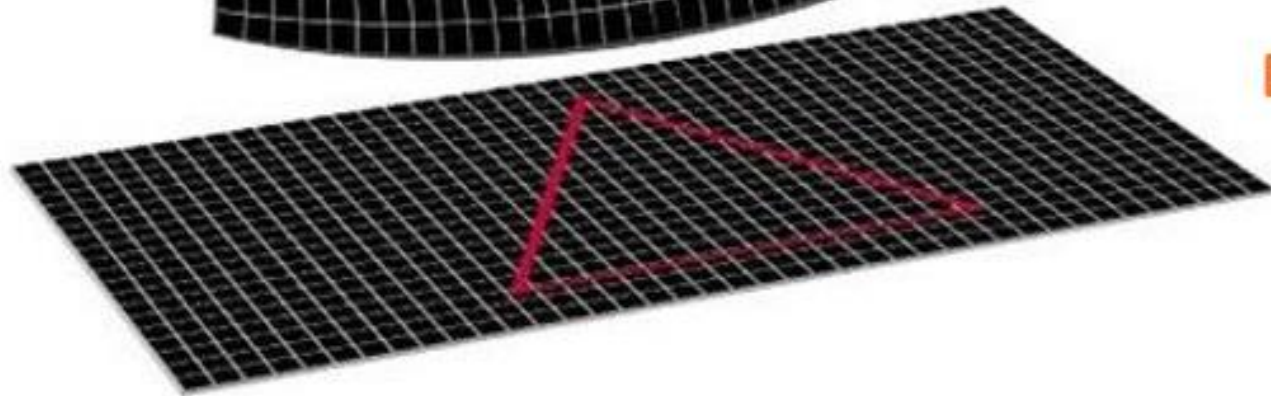
Spherical

negative

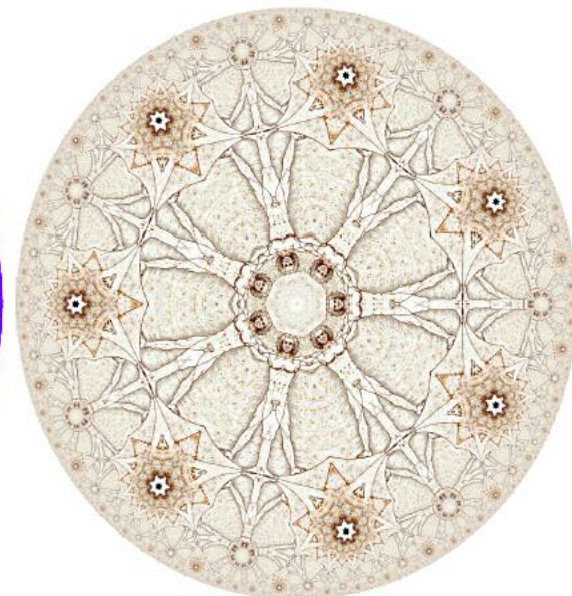
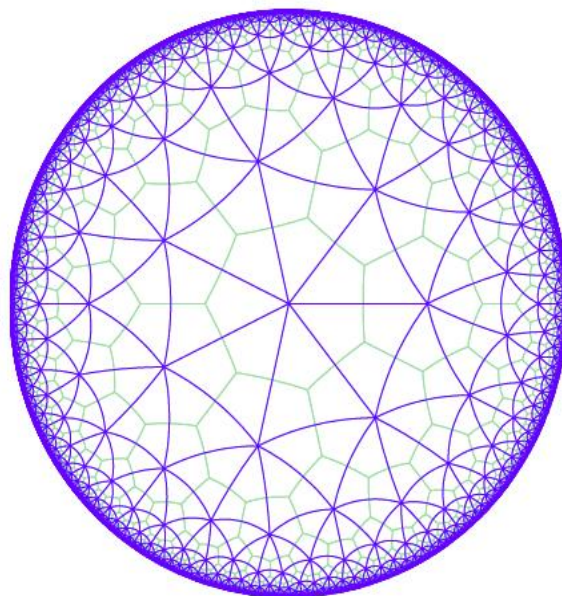
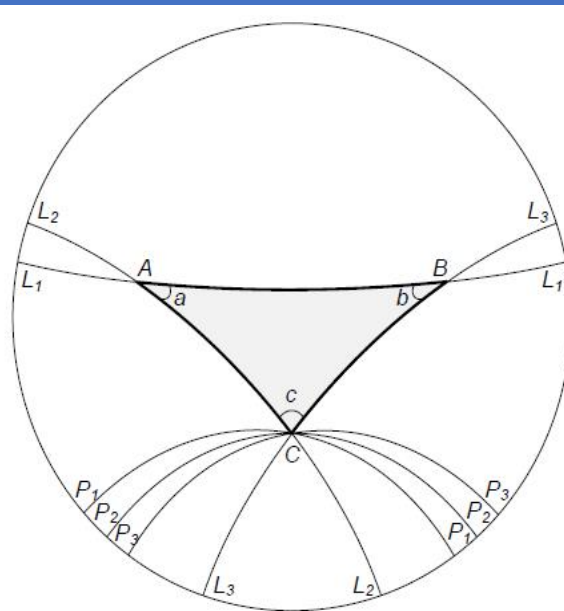
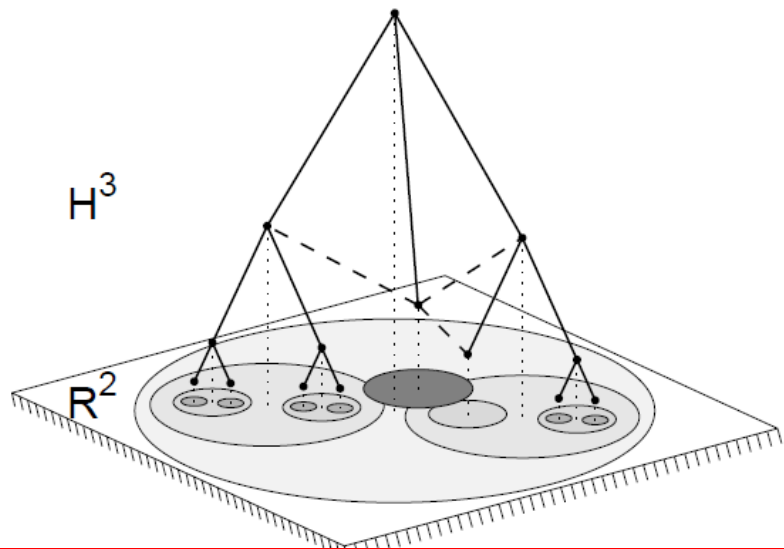


Hyperbolic

flat

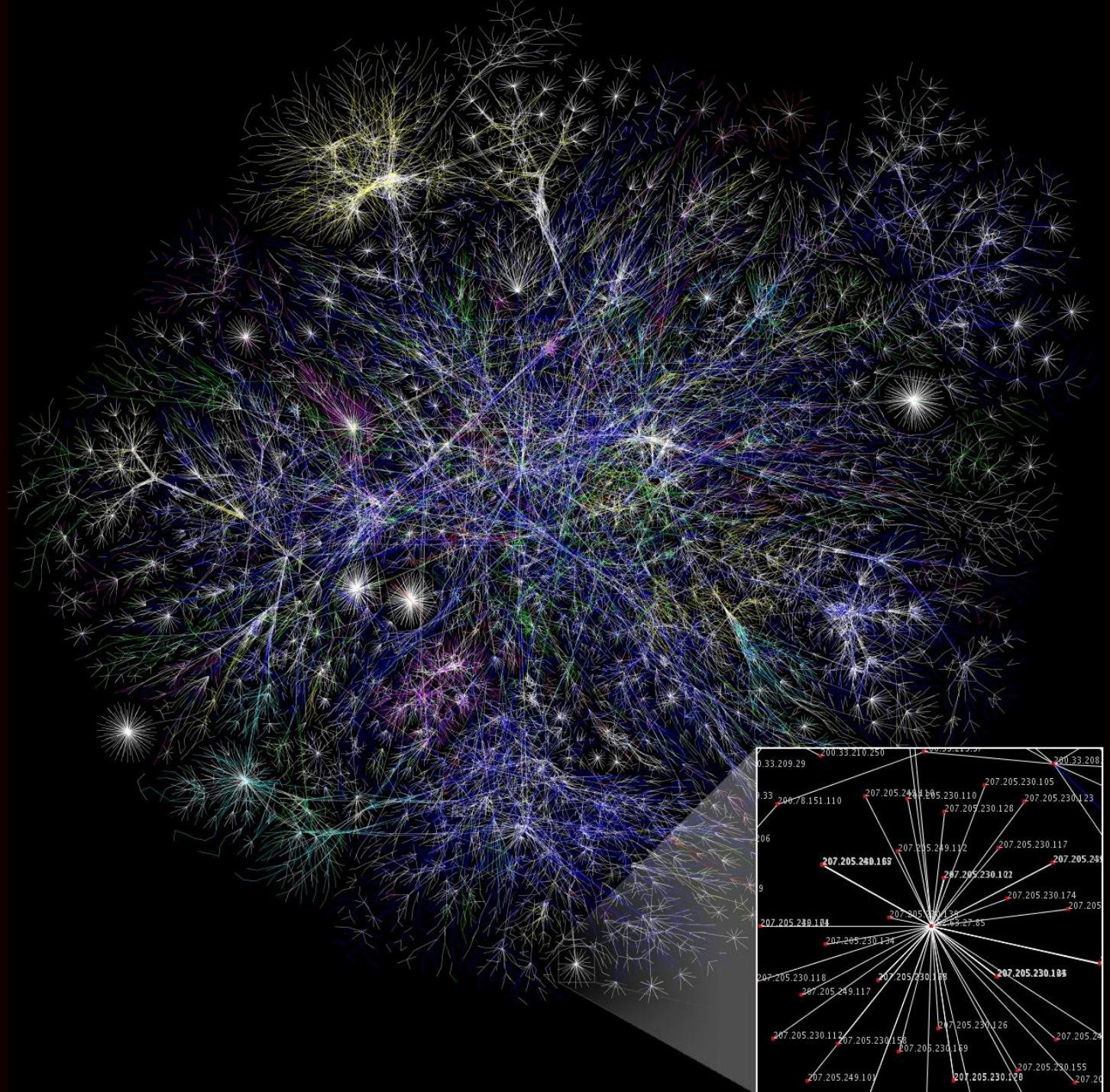


Euclidean



SCALE FREE

Power Law Node Degree Distribution

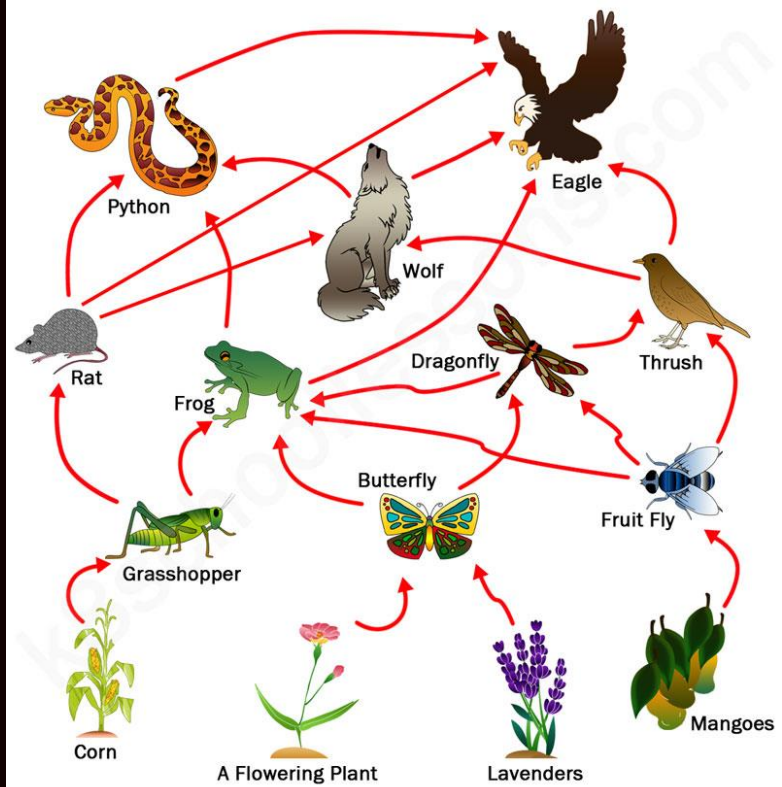








A Food Web





EXPERIMENT

Simple point and click game

N = 30

Conditions = [Hyperbolic, Euclidean]

Score = # of new nodes visited

Fuel

Hyperbolic = (Triangular Sum * #nodes)/5

Euclidean = (Triangular Sum * #nodes)/10

Design A[Hx10,Ex10,Hx10,Ex10]; B[Ex10,Hx10,Ex10,Hx10]


Hyperbolic Trials = 20

Euclidean Trials = 20

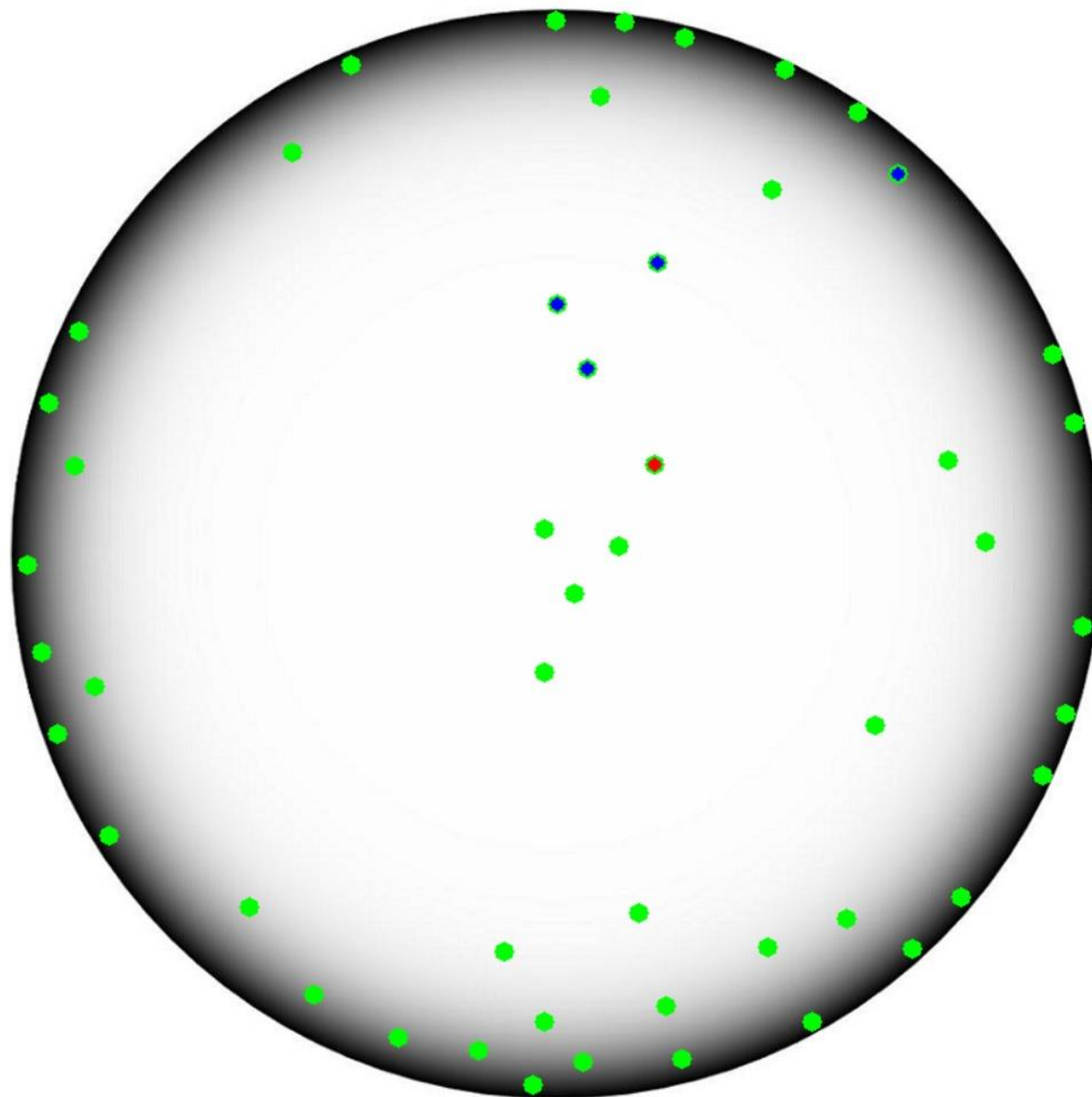
**Randomized order of maps for trials and alternating condition
order presentation**

5

Fuel



1.8823

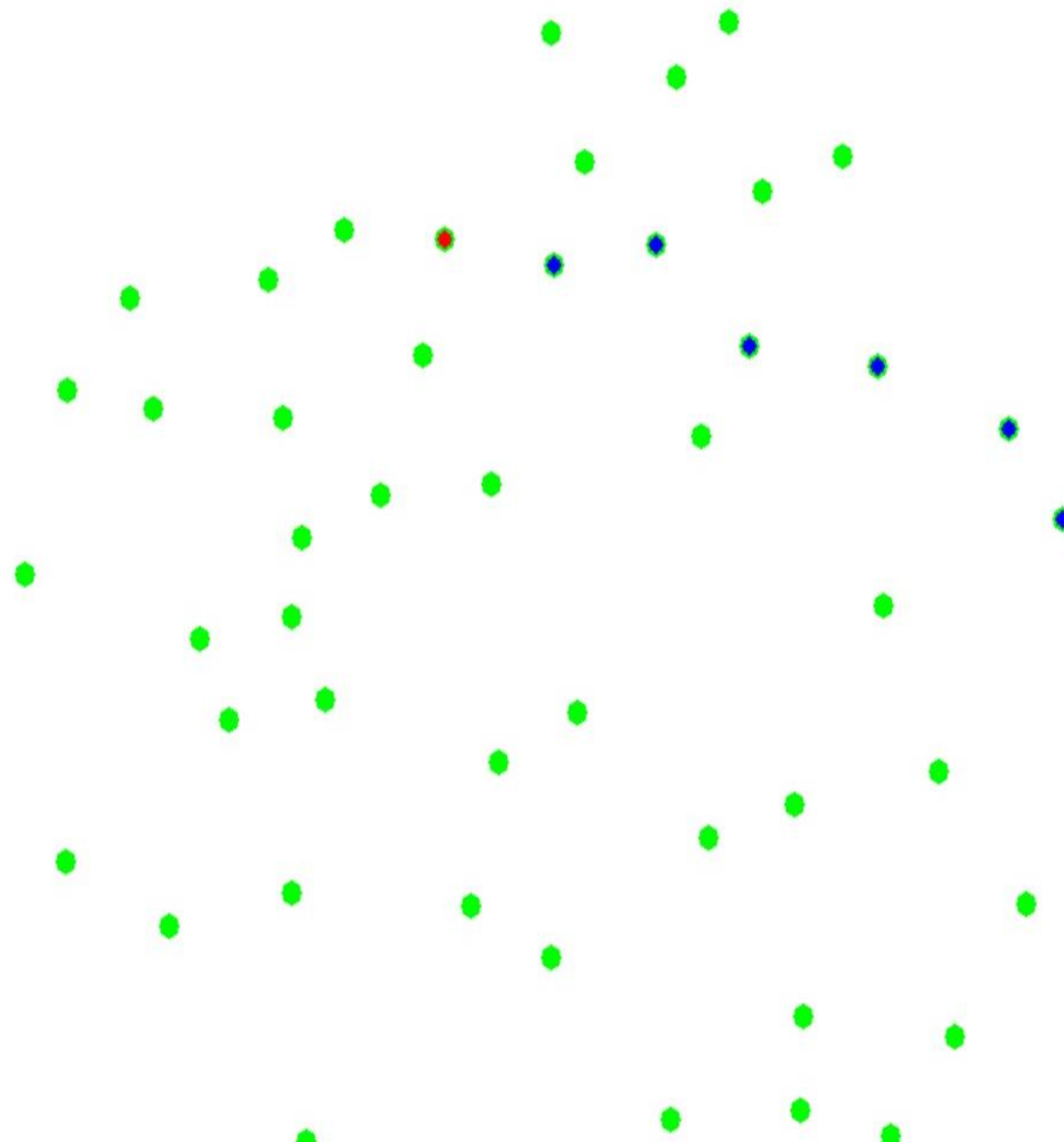


7

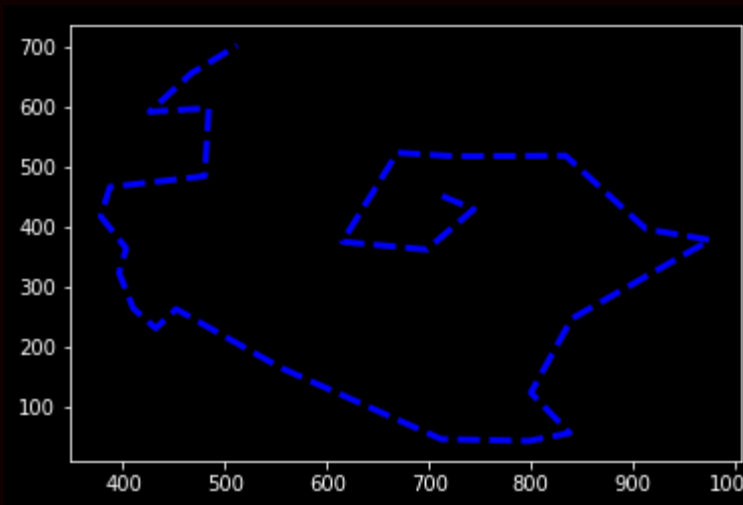
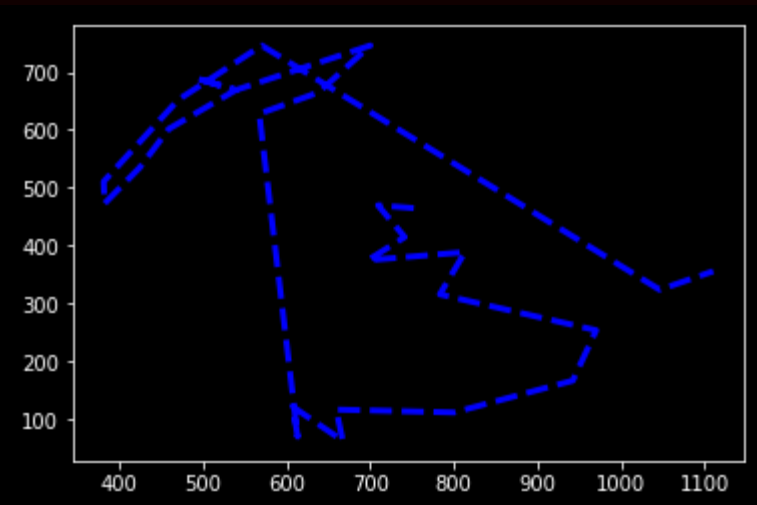
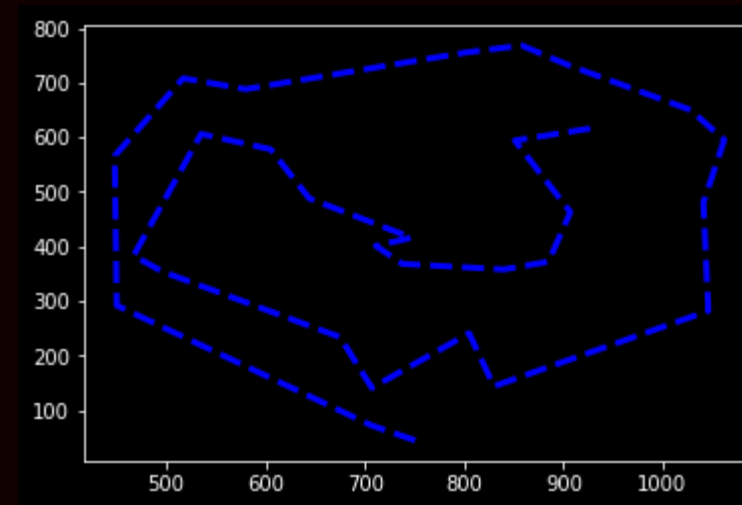
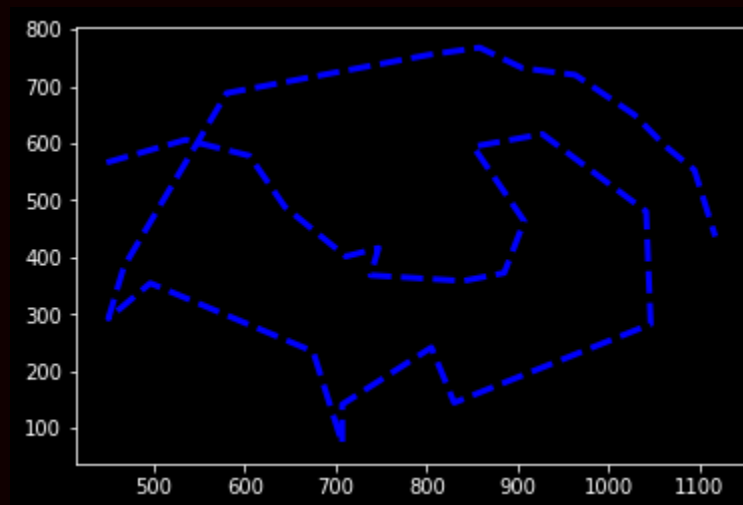
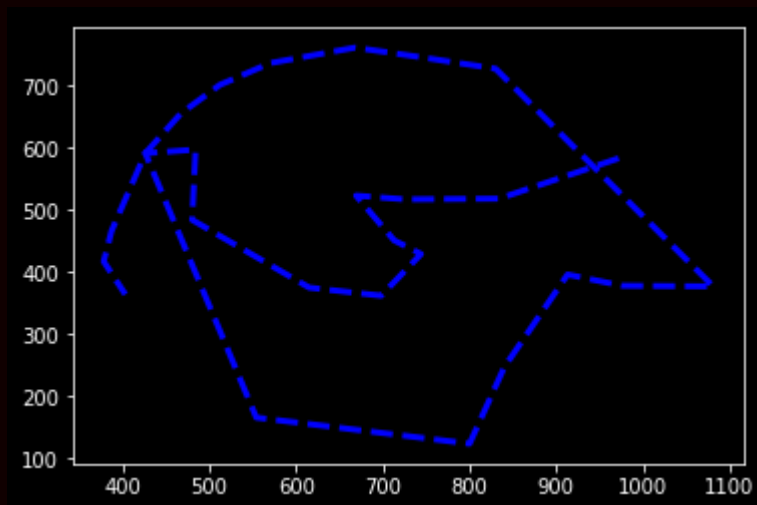
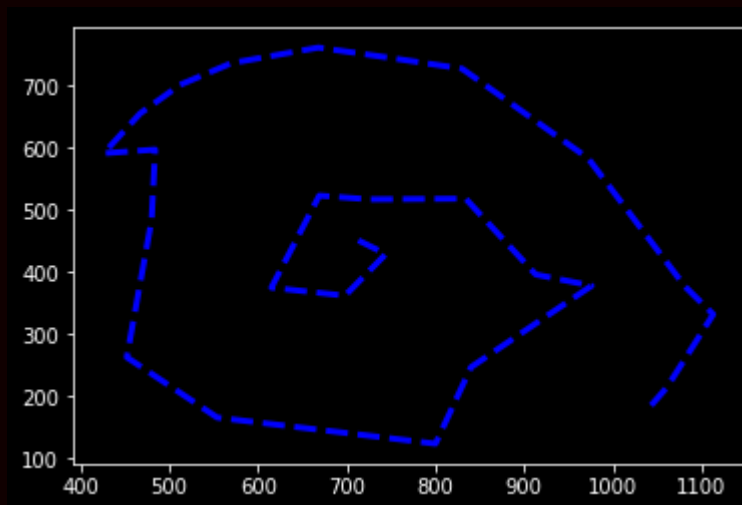
Fuel



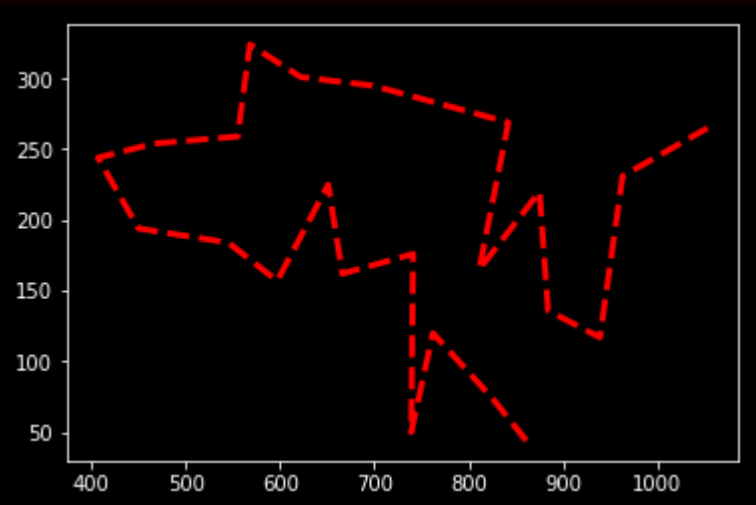
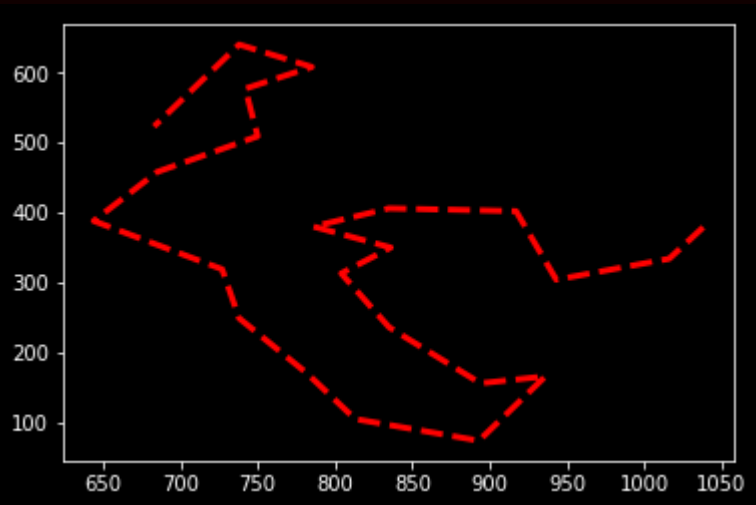
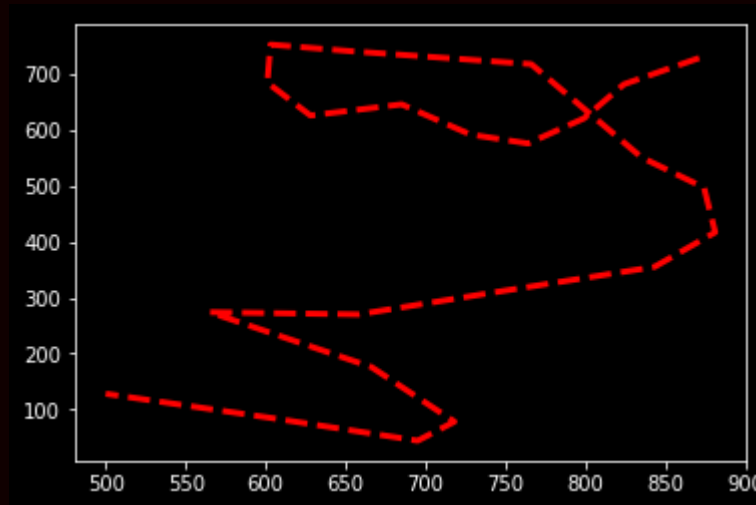
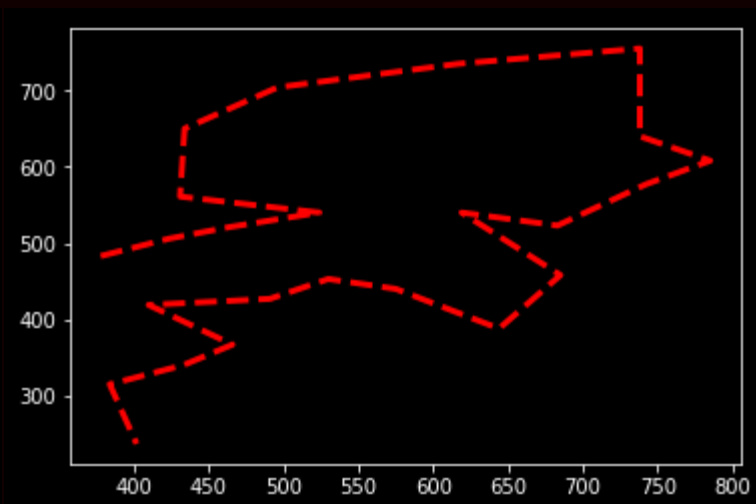
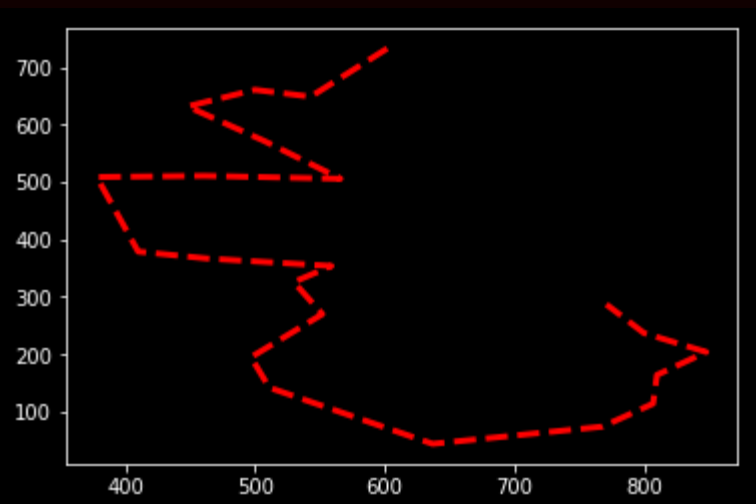
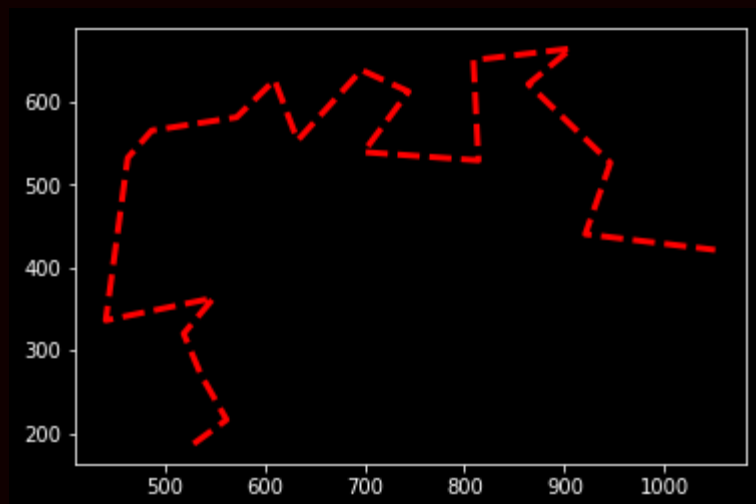
0.1865



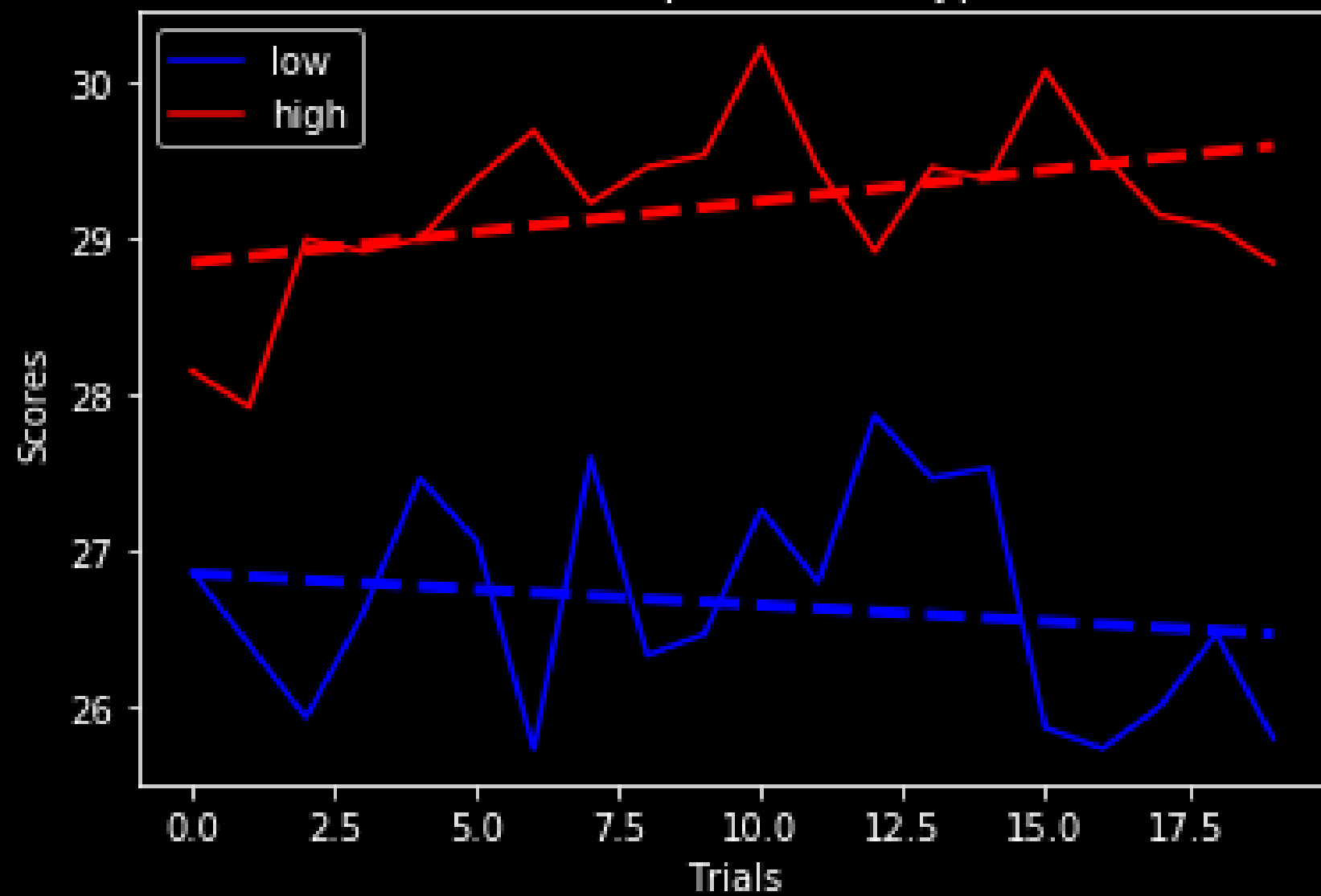
HYPERBOLIC PATHS



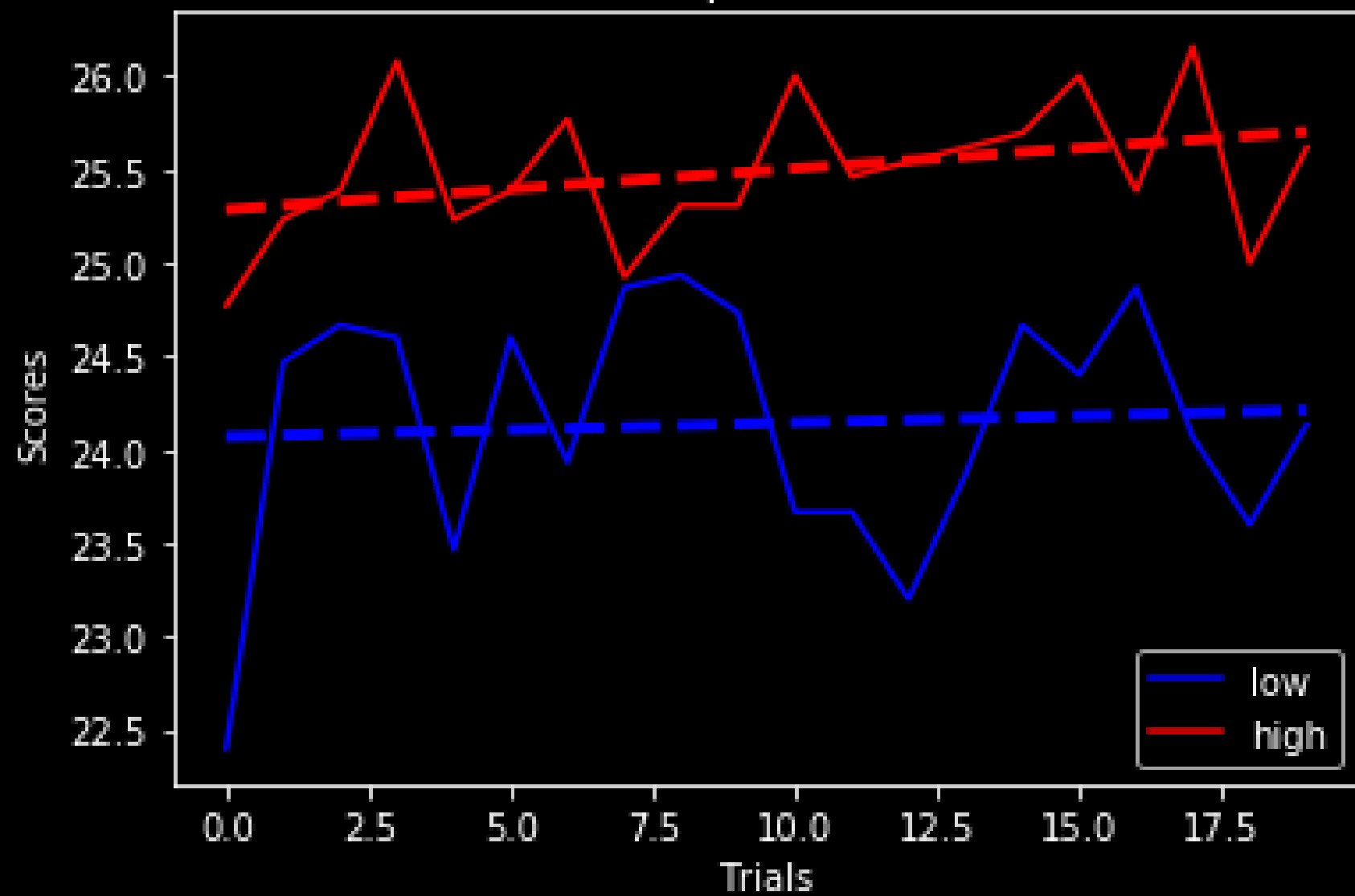
EUC LIDEAN PATHS



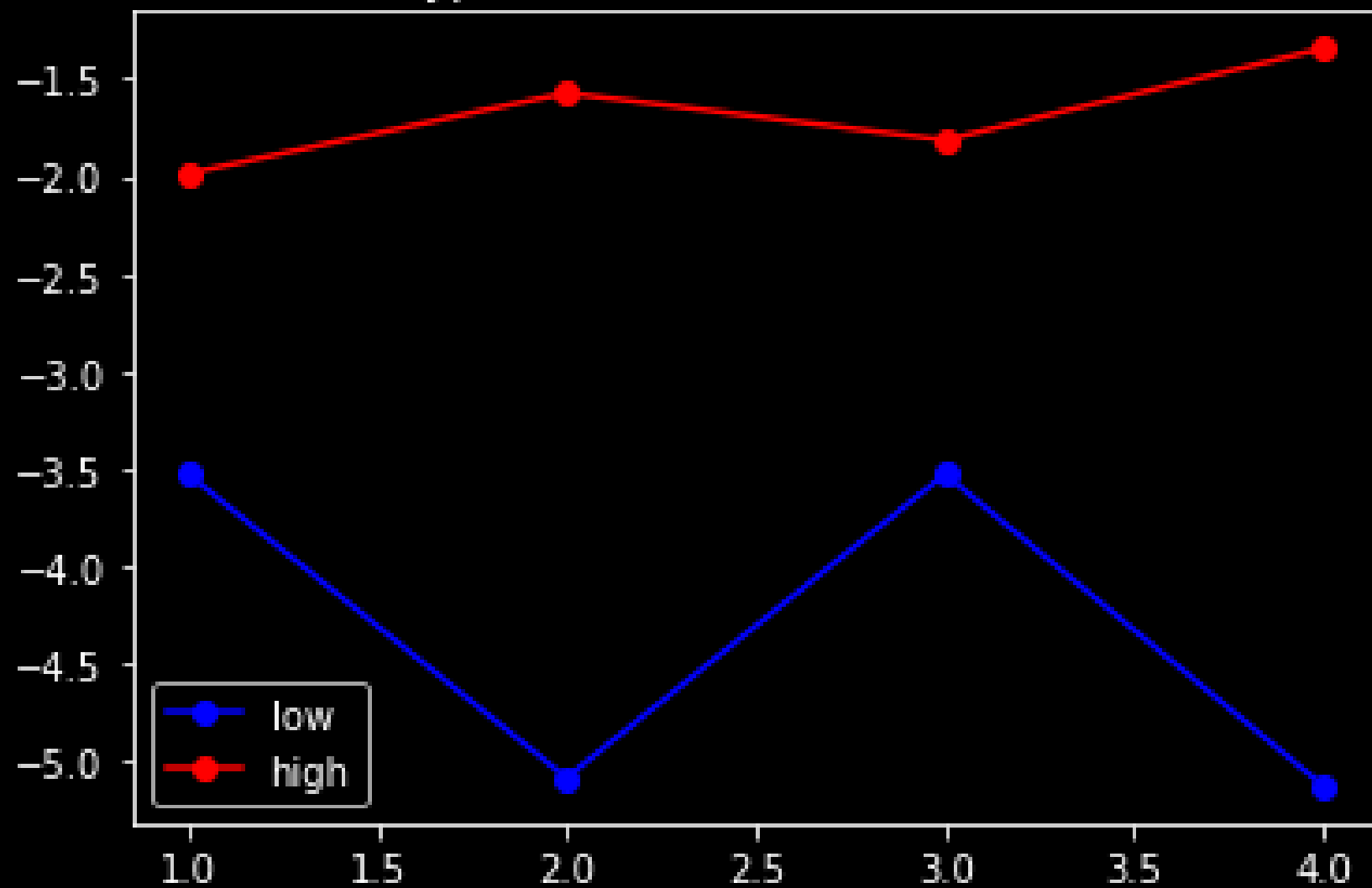
Mean Median Split Scores Hyperbolic



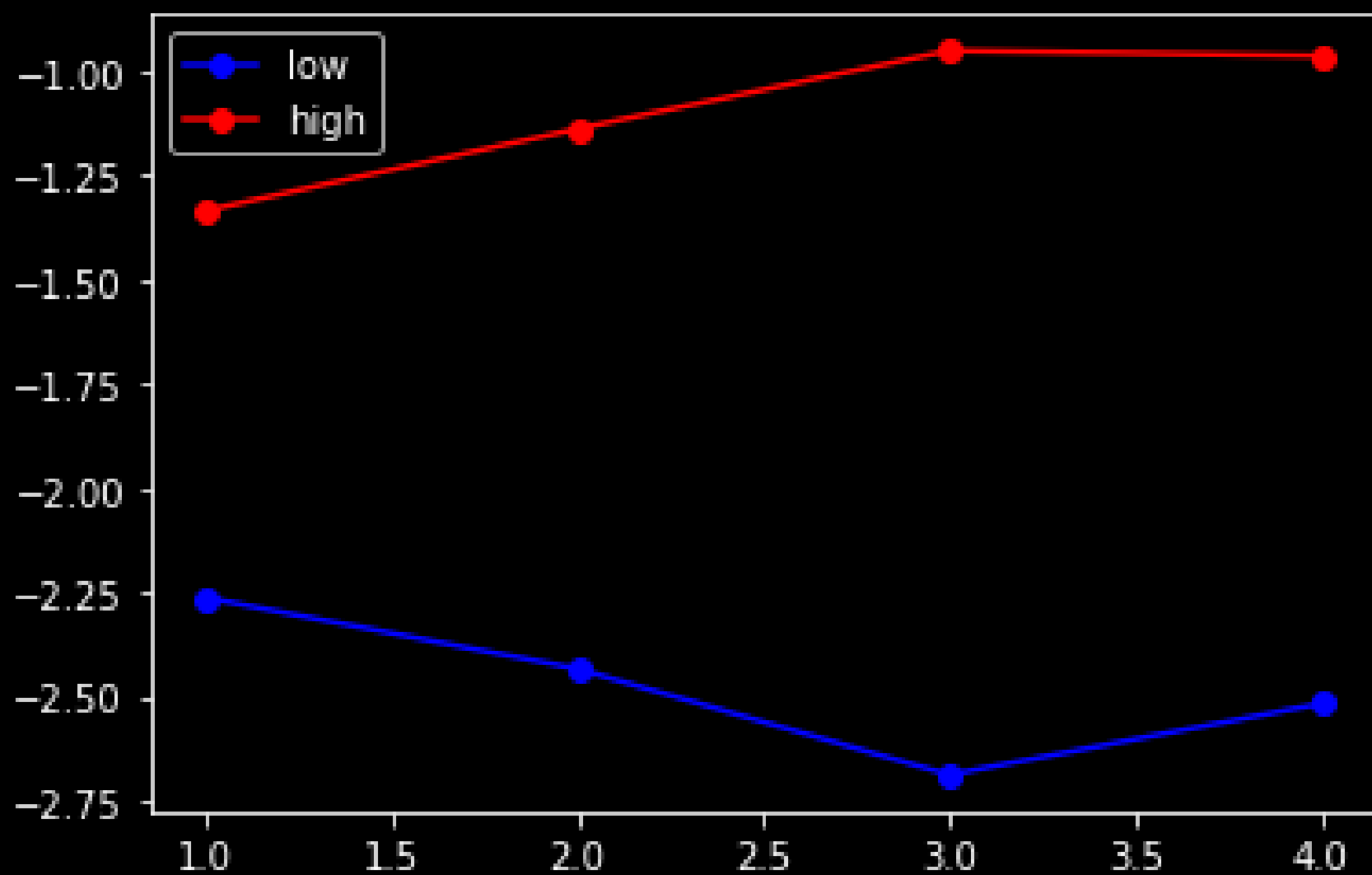
Mean Median Split Scores Euclidean



Hyperbolic Differences Per Block



Euclidean Differences Per Block



REVISITS

Hyperbolic

High:77

Low:86

Euclidean

High:21

Low:43

HUMAN VS ALGORITHM

Hyperbolic: 19 (3.4%) No revisits

Euclidean: 29 (5.2%) 1 revisit

