

GRAPH DRAWING CONTEST

2026 Report



CONTEST COMMITTEE



Sara Di Bartolomeo (co-chair)
TU Wien

Henry Förster
John Cabot University



Soeren Terziadis
TU Munich

Jules Wulms (co-chair)
TU Eindhoven

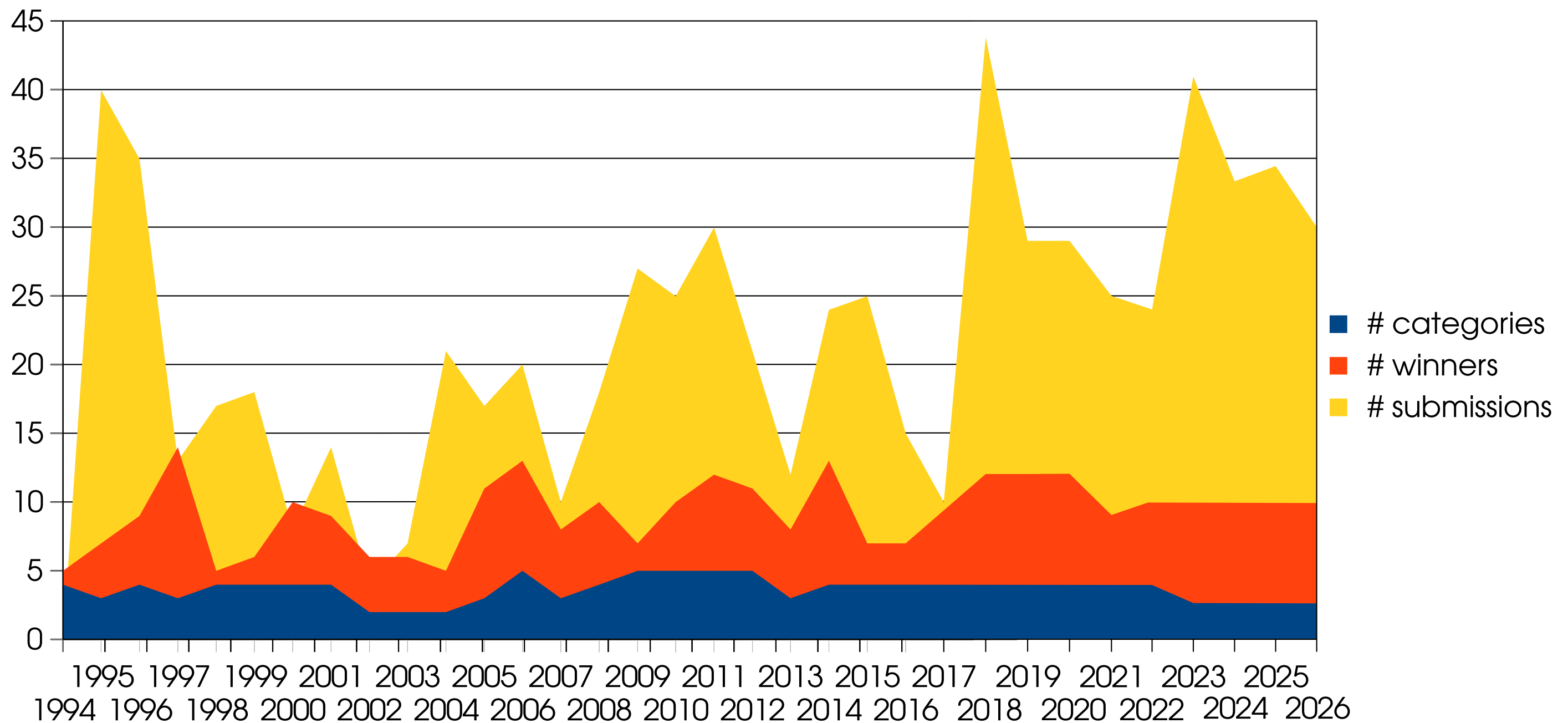


GRAPH DRAWING CONTEST

Historic Perspective

GRAPH DRAWING CONTEST

Historic Perspective



GRAPH DRAWING CONTEST

Historic Perspective

1994 Uwe Wuerker • Stefan Hougardy • Petra Mutzel & Thomas Odenthal • Georg Sander

1995 Falk Schreiber & Carsten Friedrich • Vladimir Batagelj & Andrej Mrvar • Paulis Kikusts & Peteris Rucevskis • Georg Sander

1996 Ulrich Föbmeier & Michael Kaufmann • Vladimir Batagelj & Andrej Mrvar • Falk Schreiber & Carsten Friedrich • Thomas Kamps, Jörg Klein & Thomas Reichenberger

1997 B. Bascary, B. Cattan, A. Cohen-Solal, M. Philip & H. Szigeti • Vladimir Batagelj & Andrej Mrvar • Michael Kaufmann & Gunnar Klau • Thomas Ziegler & Petra Mutzel • Cristian Ghezzi • Falk Schreiber & Carsten Friedrich

1998 Vladimir Batagelj & Andrej Mrvar • Petrus Abri Santoso & Andi Surjanto • Roland Wiese

1999 Vladimir Batagelj & Andrej Mrvar • Ulrik Brandes • Karlis Freivalds & Paulis Kikusts • Rowena Mankelow

2000 Nikola S. Nikolov • Vladimir Batagelj & Andrej Mrvar • Jan Adamec • C. Duncan, P. Gajer, M. Goodrich & S. Kobourov • Robby Schönfeld & Nikola S. Nikolov

2001 Ulrik Brandes & Marco Gärtler • C. Gutwenger, K. Klein, J. Kupke & S. Leipert • Roland Wiese • Carsten Friedrich • Merijam Percan

2002 Daniel Gmach • Paul Holleis & Thomas Zimmermann • Nikola S. Nikolov & Patrick Healey • Christoph Vogt

2003 Daniel Gmach, Paul Holleis & Thomas Zimmermann • Christian Kuklas, Dirk Koschützki & Falk Schreiber

2004 Andrei Grecu & Gunnar Klau • Ulrik Brandes, Daniel Fleischer & Thomas Puppe

2005 Markus Chimani, Carsten Gutwenger & Karsten Klein • V. Batagelj, A. Mrvar, A. Ahmed, X. Fu, S. Hong & D. Merrick • Marco Gärtler & Markus Krug

2006 Michael McGuffin • Adel Admed, Seok-Hee Hong, Quan Nguyen & Donald Taylor • Adel Admed, Xiaoyan Fu, Seok-Hee Hong, Quan Nguyen & Kai Xu • Fabrizio Frati & Markus Geyer • Andreas Gerasch & team

2007 Wolfgang Brunner & Jens Schmidt • Robert Theron, Rodrigo Santamaria, Juan Garcia, Diego Gomez & Vadim Paz-Madrid • Felix Heinen

2008 Yifan Hu & Emden Gansner • Melanie Badent & Pietro Palladino • Melanie Badent, Martin Mader & Christian Piech • Hoi-Ming Wong, Markus Chimani & Karsten Klein

2009 Hui Liu • Nicholas Jefferson • Melanie Badent & Michael Baur • Hoi-Ming Wong & Karsten Klein • Joe Fowler

2010 Quan Nguyen • Sergey Pupyrev • M. Baur, M. Siebenhaller, R. Wiese & Thomas Wurst • Petra Mutzel & Hoi-Ming Wong • Maarten Löffler & Martin Nöllenburg

2011 Hanley Weng • M. Löffler, D. Eppstein, M. Goodrich & S. Kobourov • R. Zelina, S. Bota, S. Houtman & R. Ban • Sergey Pupyrev • Maarten Löffler & Martin Nöllenburg

2012 Roman Prutkin • Sergey Pupyrev • Remus Zelina, S. Bota, S. Houtman & R. Balaban • Tobias Brinkjost • A. Bauer, I. Rutter, J. Vordermeier & M. Kaufmann

2013 Jos de Jong & Giovanni Paziienza • Remus Zelina, Sebastian Bota, Siebren Houtman & Radu Balaban • Thomas Bläsius & Ignaz Rutter

2014 Martin Nöllenburg • Remus Zelina, Sebastian Bota, Siebren Houtman & Radu Balaban • Tamara Mchedlidze, Martin Nöllenburg, Alexander Khomenko, Igor Karlinsky & Denis Knöpfle • Philipp Kindermann, Fabian Lipp & Wadim Reimche

2015 Tamara Mchedlidze • Jennifer Hood & Pat Morin • Boris Klemz, Ulf Rüegg & Fabian Lipp • Josef Cibulka

2016 Fabian Klute • Jonathan Klawitter & Tamara Mchedlidze • Michael Bekos, Thanasis Lianes & Chrysanthi Raftopoulou • Johan de Ruiter

2017 Steven Shangzhou Wang • Fabian Klute & Irene Parada • Theresa Fröschl, Jonathan Klawitter & Darren Strash • Almut Demel, Dominik Dürschnabel, Tamara Mchedlidze, Marcel Radermacher & Lasse Wulf

2018 Evmorfia Argyriou, Michael Baur, Anne Eberle & Armin Gufler • Florian Grötschla, Tamar Mirbach, Christian Ortlieb, Tamara Mchedlidze & Marcel Radermacher • Myroslav Kryven & Johannes Zink • Amadäus Spallek, Christian Geckeler, Henry Förster & Michael Bekos

2019 Evmorfia Argyriou, Christian Brunnermeier, Anne Eberle & Johannes Rössel • Guangping Li, Soeren Nickel, Martin Nöllenburg, Ivan Viola & Hsiang-Yun Wu • Evmorfia Argyriou, Henry Förster & Martin Gronemann • Solveig Klepper, Axel Kuckuk, Paul Palomero Bernardo, Maximilian Pfister, Patrizio Angelini, Michalis Bekos & Michael Kaufmann

2020 Tamara Drucks, Moritz Leidinger & Giulio Pace • Rupert Ettrich, Julian Haumer & Samantha Fuchs • Jonathan Klawitter & Johannes Zink • Solveig Klepper, Axel Kuckuk, Paul Palomero Bernardo, Maximilian Pfister, Patrizio Angelini, Michalis Bekos, Henry Förster, & Michael Kaufmann

2021 Simon Pointner, David Ammer & Thorsten Korpitsch • Jonathan Klawitter & Felix Klesen • Moritz Greiner, Axel Kuckuk, Michael Bekos & Maximilian Pfister

2022 Thomas Depian, Michael Huber & Wilhelm Wanecek • Axel Kuckuk, Henry Förster & Sarah Gester • Fouli Argyriou & Henry Förster • Laurent Moalic, Dominique Schmitt & Julien Bianchetti

2023 André Schulz • Christoph Kern, Manuel Oberbacher & Horst Zahradnik • Tim Hegemann, Florentina Voboril & Johannes Zink • Julien Bianchetti, Laurent Moalic & Dominique Schmitt

2024 Hoang An Nguyen, Nico Martin, Jannik Brandstetter & Micha Fauth • Tim Hegemann & Johannes Zink • Julien Bianchetti, Pauline Blavy, Guilhem Gerouille, Laurent Moalic & Dominique Schmitt

2025 Florian Saß, Jakob Speitkamp & Guilherme Monteiro Oliveira • Giordano Andreolna, Philipp Kindermann & Allegra Strippoli • Julien Bianchetti & Laurent Moalic

2026 ?

2026 CONTEST

Overview

2026 CONTEST

Overview

CREATIVE TOPIC

LIVE CHALLENGE

2026 CONTEST

Overview

CREATIVE TOPIC

LIVE CHALLENGE

The Eurovision Song Contest

Visualize voting patterns across years in
Eurovision. What has changed or
remained consistent across years?

2026 CONTEST

Overview

CREATIVE TOPIC

The Eurovision Song Contest

Visualize voting patterns across years in Eurovision. What has changed or remained consistent across years?

LIVE CHALLENGE

Find a k -planar straight-line drawing of a graph that minimizes k . The vertices should be placed on a grid.

2026 CONTEST

Overview

CREATIVE TOPIC

The Eurovision Song Contest

Visualize voting patterns across years in Eurovision. What has changed or remained consistent across years?

LIVE CHALLENGE

Find a k -planar straight-line drawing of a graph that minimizes k . The vertices should be placed on a grid.

manual category

automatic category

2026 CONTEST

Overview

CREATIVE TOPIC

The Eurovision Song Contest

Visualize voting patterns across years in Eurovision. What has changed or remained consistent across years?

6 submissions

LIVE CHALLENGE

Find a k -planar straight-line drawing of a graph that minimizes k . The vertices should be placed on a grid.

manual category

automatic category

2026 CONTEST

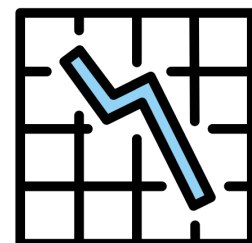
Overview

CREATIVE TOPIC

The Eurovision Song Contest

Visualize voting patterns across years in Eurovision. What has changed or remained consistent across years?

6 submissions



LIVE CHALLENGE

Find a k -planar straight-line drawing of a graph that minimizes k . The vertices should be placed on a grid.

manual category

automatic category

2026 CONTEST

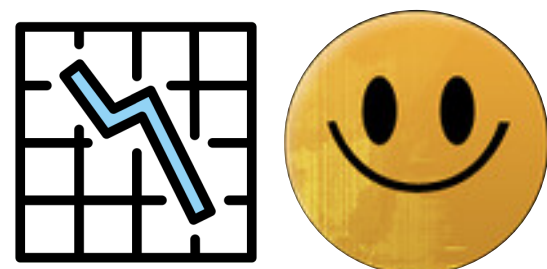
Overview

CREATIVE TOPIC

The Eurovision Song Contest

Visualize voting patterns across years in Eurovision. What has changed or remained consistent across years?

6 submissions



LIVE CHALLENGE

Find a k -planar straight-line drawing of a graph that minimizes k . The vertices should be placed on a grid.

manual category

automatic category

2026 CONTEST

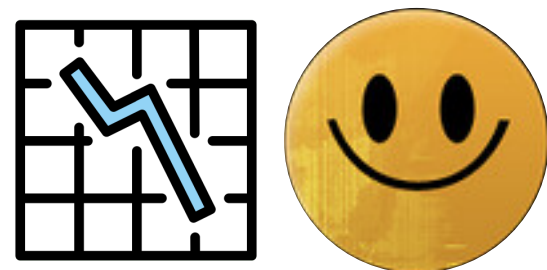
Overview

CREATIVE TOPIC

The Eurovision Song Contest

Visualize voting patterns across years in Eurovision. What has changed or remained consistent across years?

6 submissions



LIVE CHALLENGE

Find a k -planar straight-line drawing of a graph that minimizes k . The vertices should be placed on a grid.

manual category

13 teams

automatic category

2026 CONTEST

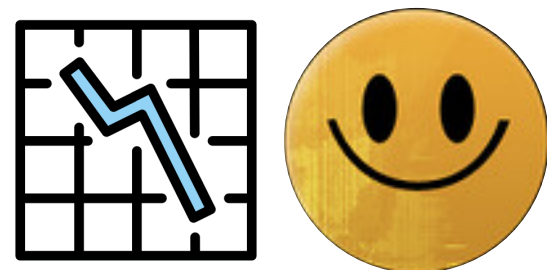
Overview

CREATIVE TOPIC

The Eurovision Song Contest

Visualize voting patterns across years in Eurovision. What has changed or remained consistent across years?

6 submissions



LIVE CHALLENGE

Find a k -planar straight-line drawing of a graph that minimizes k . The vertices should be placed on a grid.

manual category

13 teams

automatic category

11 teams

2026 CONTEST

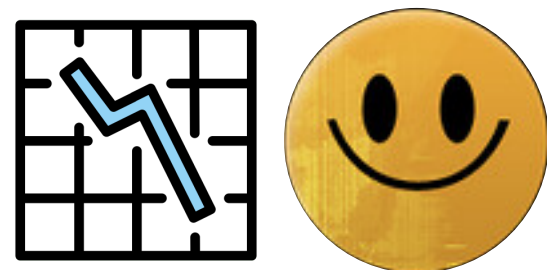
Overview

CREATIVE TOPIC

The Eurovision Song Contest

Visualize voting patterns across years in Eurovision. What has changed or remained consistent across years?

6 submissions



LIVE CHALLENGE

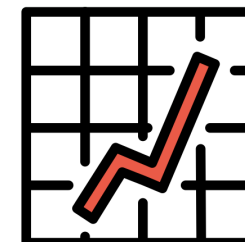
Find a k -planar straight-line drawing of a graph that minimizes k . The vertices should be placed on a grid.

manual category

13 teams

automatic category

11 teams



2026 CONTEST

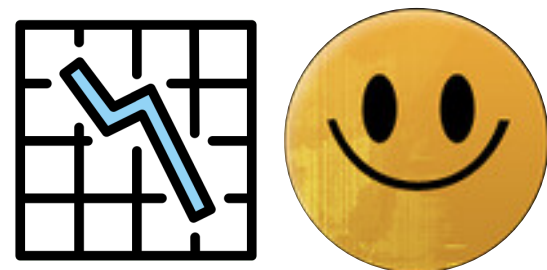
Overview

CREATIVE TOPIC

The Eurovision Song Contest

Visualize voting patterns across years in Eurovision. What has changed or remained consistent across years?

6 submissions



LIVE CHALLENGE

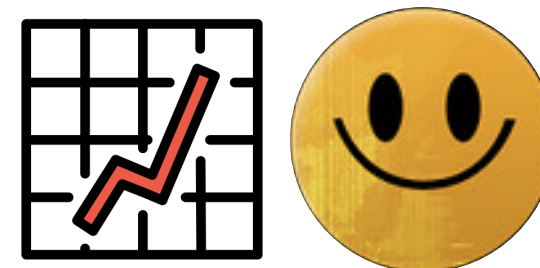
Find a k -planar straight-line drawing of a graph that minimizes k . The vertices should be placed on a grid.

manual category

13 teams

automatic category

11 teams



GRAPH DRAWING CONTEST

Creative Topic

GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of
the *Eurovision Song Contest*

GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of
the *Eurovision Song Contest*



GRAPH DRAWING CONTEST

Creative Topic

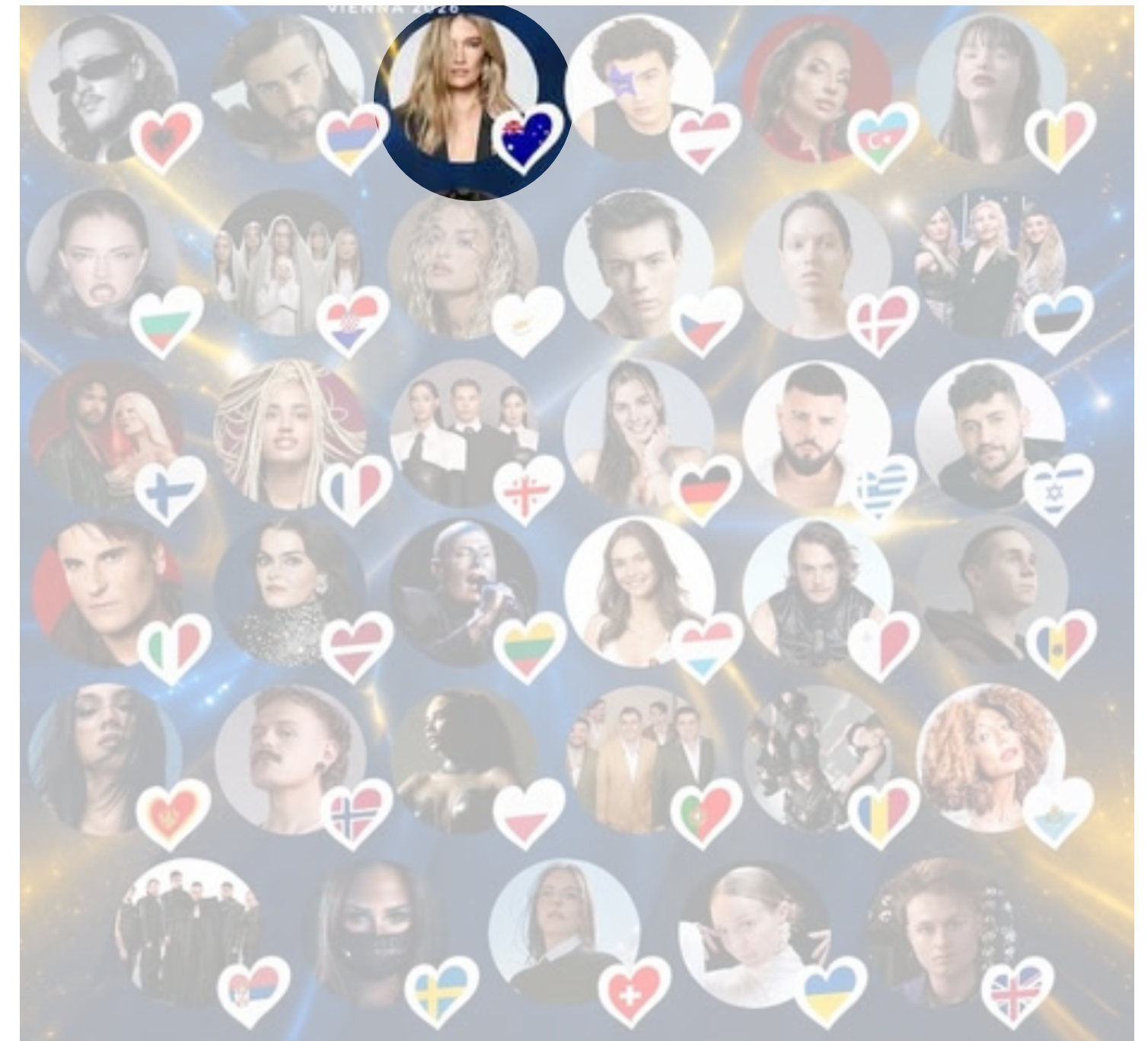
Visualize voting patterns of
the *Eurovision Song Contest*



GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of
the *Eurovision Song Contest*



GRAPH DRAWING CONTEST

Creative Topic

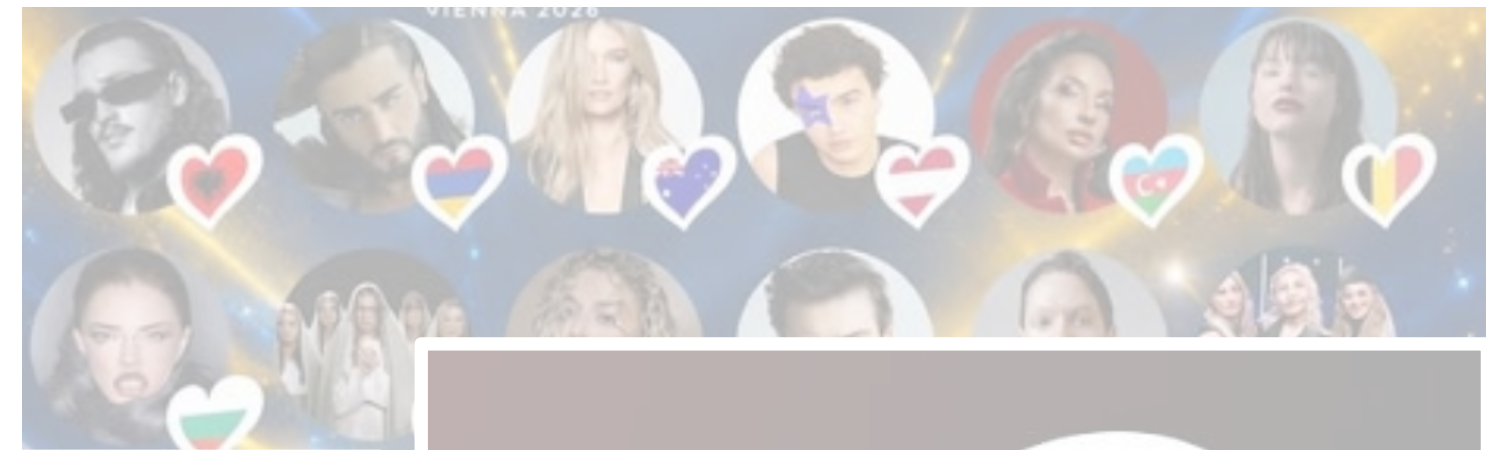
Visualize voting patterns of
the *Eurovision Song Contest*



GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of
the *Eurovision Song Contest*



GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of the *Eurovision Song Contest*



GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of the *Eurovision Song Contest*



GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of
the *Eurovision Song Contest*

Attribute	Type	Description
year	integer	Year in which the contest was held
arena	string	Building where the contest was held
city	string	Host city
country	string	Host country code
intendedCountry	string	If not null stores the code of the country that should have been the host but couldn't (Ukraine 2023)
slogan	string	Slogan of the contest
logoUrl	string	Link to contest thumbnail
presenters	string[]	Presenters of the edition
broadcasters	string[]	Host broadcasters of the contest
contestants	Contestant reference[]	Endpoint to get contestant details
rounds	Round[]	All rounds of the contest

GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of
the *Eurovision Song Contest*

Attribute	Type	Description
year	integer	Year in which the contest was held
arena	string	Building where the contest was held
city	string	Host city
country	string	Host country code
intendedCountry	string	If not null stores the code of the country that should have been the host but couldn't (Ukraine 2023)
slogan	string	Slogan of the contest
logoUrl	string	Link to contest thumbnail
presenters	string[]	Presenters of the edition
broadcasters	string[]	Host broadcasters of the contest
contestants	Contestant reference[]	Endpoint to get contestant details
rounds	Round[]	All rounds of the contest

GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of the *Eurovision Song Contest*

Attribute	Type	Description
year	integer	Year in which the contest was held
arena	string	Building where the contest was held
city	string	Host city
country	string	Host country code
intendedCountry	string	If not null stores the code of the country that should have won (2023)
slogan	string	Slogan of the contest
logoUrl	string	Link to contest thumbnail
presenters	string[]	Presenters of the edition
broadcasters	string[]	Host broadcasters of the contest
contestants	Contestant reference[]	Endpoint to get contestant details
rounds	Round[]	All rounds of the contest

Contestant (scheme)		
It represents each of the contestant songs of the edition.		
Attribute	Type	Description
id	integer	Contestant ID (used in Performance)
country	string	Code of the country that is represented
artist	string	Name of the singer/group performing
song	string	Song title
videoUrls	string[]	Links to Youtube videos showing the song
lyrics	Lyrics[]	All lyrics of the song with translations
bpm	integer?	Beats per minute of the song (can be null)
tone	string	Key and scale of the song
artistPeople	string[]	The real name of the artist; if the artist is a group
backings	string[]	Song backings
dancers	string[]	Song dancers
stageDirector	string	Song stage director
composers	string[]	Song composers
conductor	string	Song conductor (Only in the senior edition)
lyricists	string[]	Song lyricists
writers	string[]	Song writers
broadcaster	string	Candidate country broadcaster
commentators	string[]	Candidate country commentators
jury	string[]	The professional jury responsible for a country
spokesperson	string	Candidate country spokesperson

GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of the *Eurovision Song Contest*

Attribute	Type	Description
year	integer	Year in which the contest was held
arena	string	Building where the contest was held
city	string	Host city
country	string	Host country code
intendedCountry	string	If not null stores the code of the country that should have been the host but couldn't (Ukraine 2023)
slogan	string	Slogan of the contest
logoUrl	string	Link to contest thumbnail
presenters	string[]	Presenters of the edition
broadcasters	string[]	Host broadcasters of the contest
contestants	Contestant reference[]	Endpoint to get contestant details
rounds	Round[]	All rounds of the contest

GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of the *Eurovision Song Contest*

Attribute	Type	Description
year	integer	Year in which the contest was held
arena	string	Building where the contest was held
city	string	Host city
country	string	Host country code
intendedCountry	string	If not null stores the code of the country that should have been the host (2023)
slogan	string	Slogan of the contest
logoUrl	string	Link to contest thumbnail
presenters	string[]	Presenters of the edition
broadcasters	string[]	Host broadcasters of the contest
contestants	Contestant reference[]	Endpoint to get contestant details
rounds	Round[]	All rounds of the contest

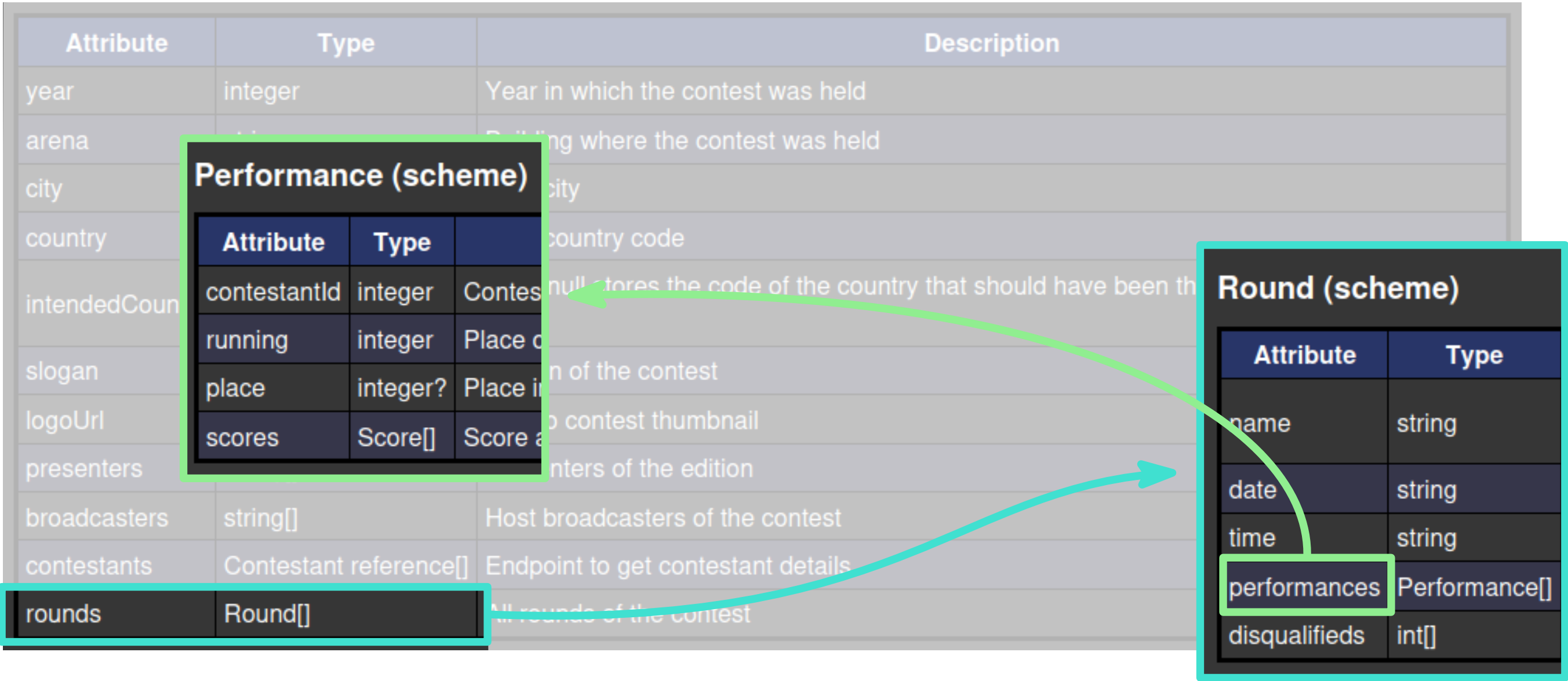
Round (scheme)

Attribute	Type
name	string
date	string
time	string
performances	Performance[]
disqualifieds	int[]

GRAPH DRAWING CONTEST

Creative Topic

Visualize voting patterns of the *Eurovision Song Contest*

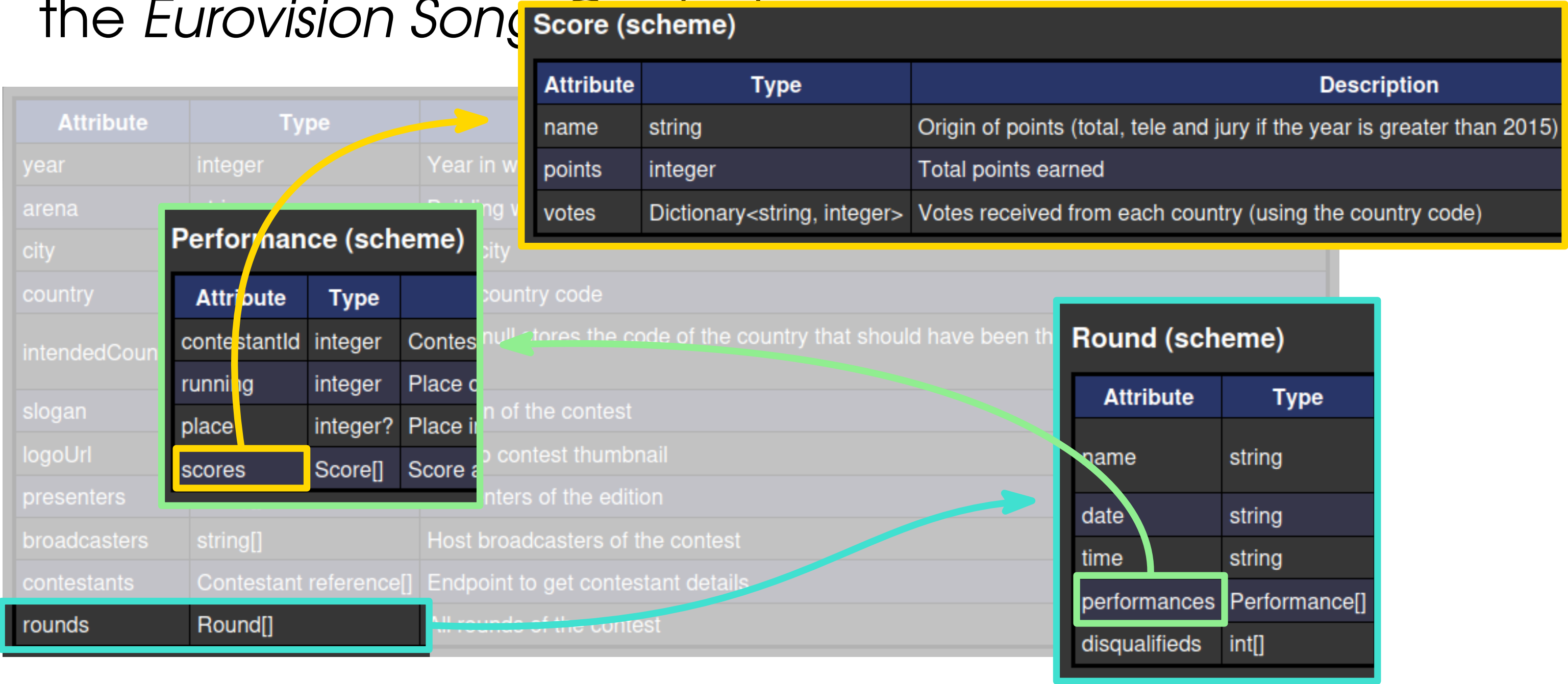


GRAPH DRAWING CONTEST

Creative Topic

(Kotrotsiou, Hantias & Stavrinides, 2026)

Visualize voting patterns of
the *Eurovision Song Contest*

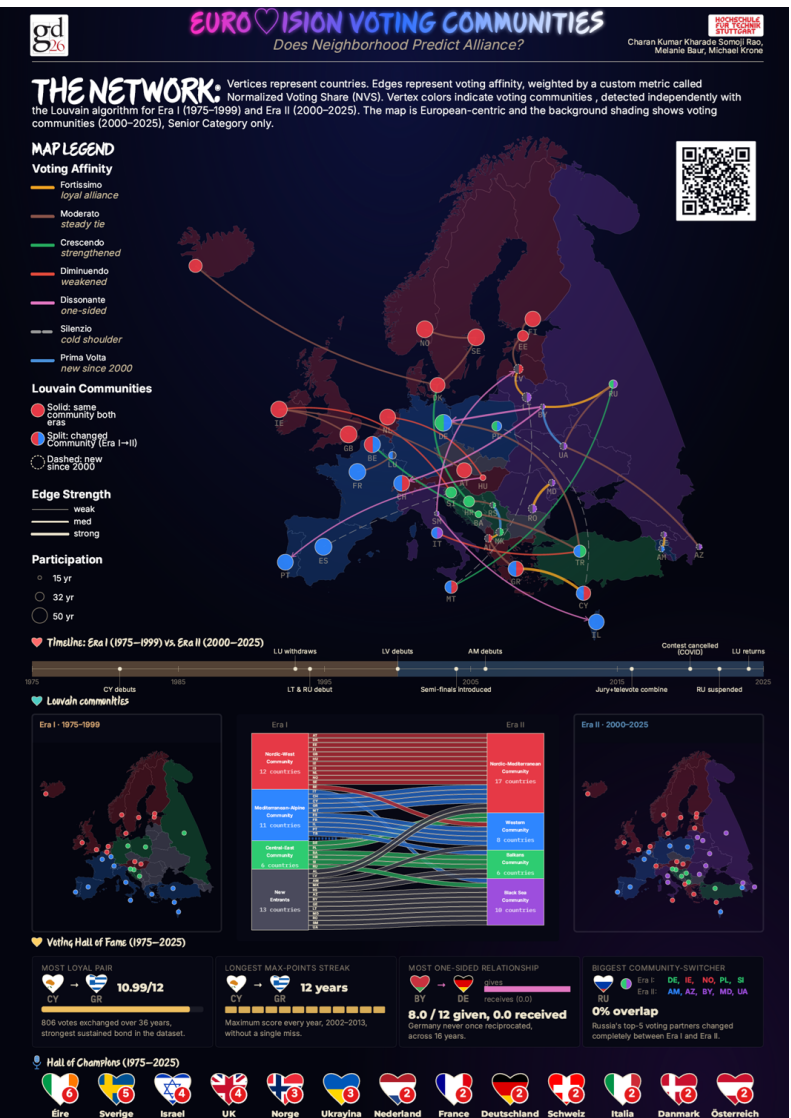
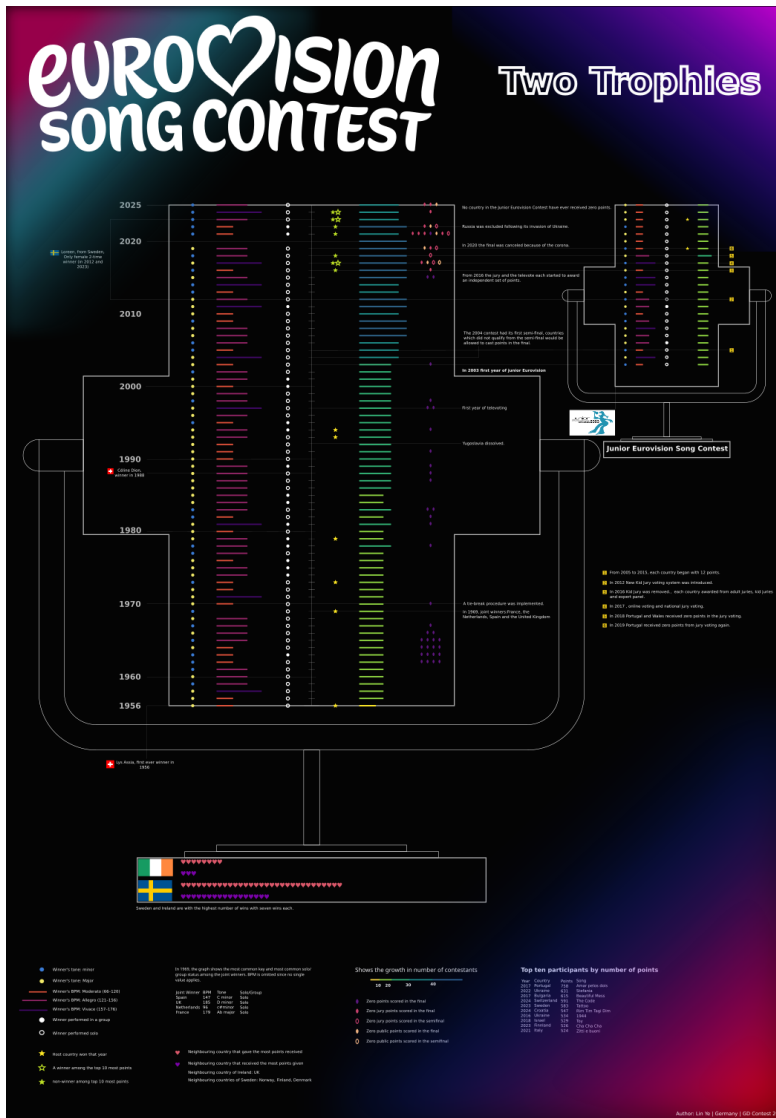
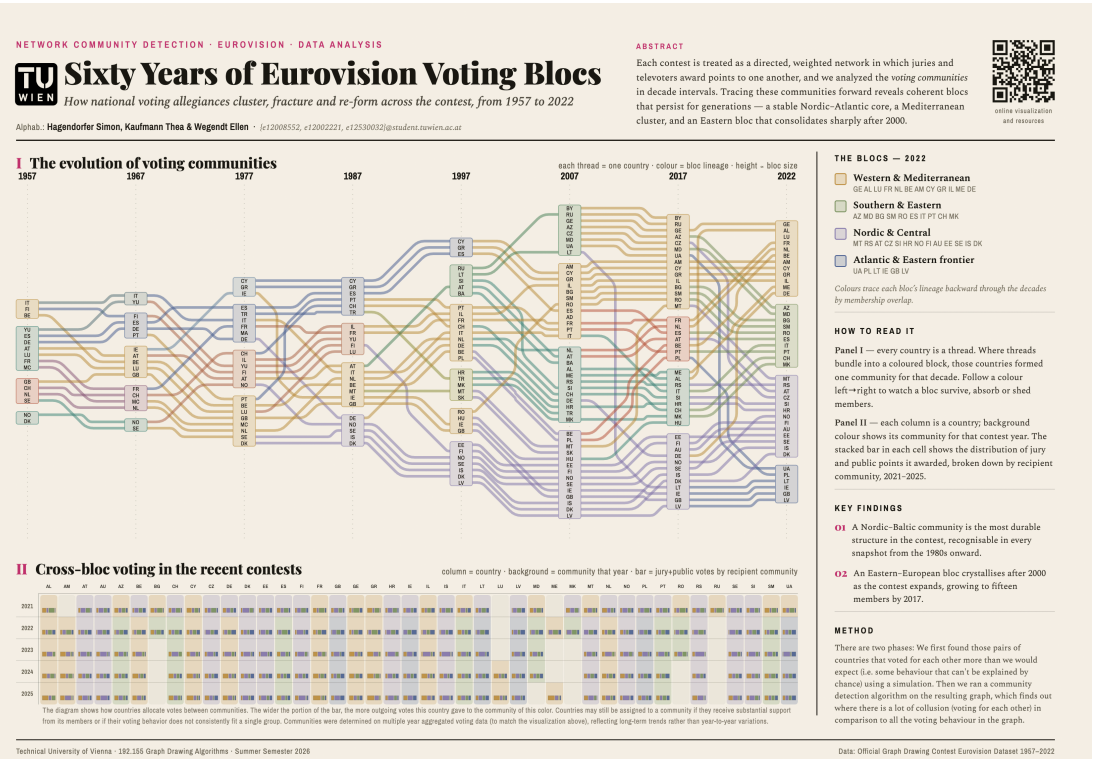
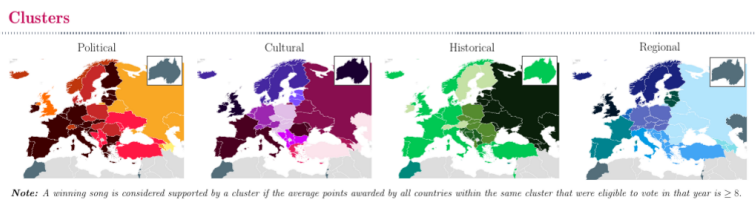
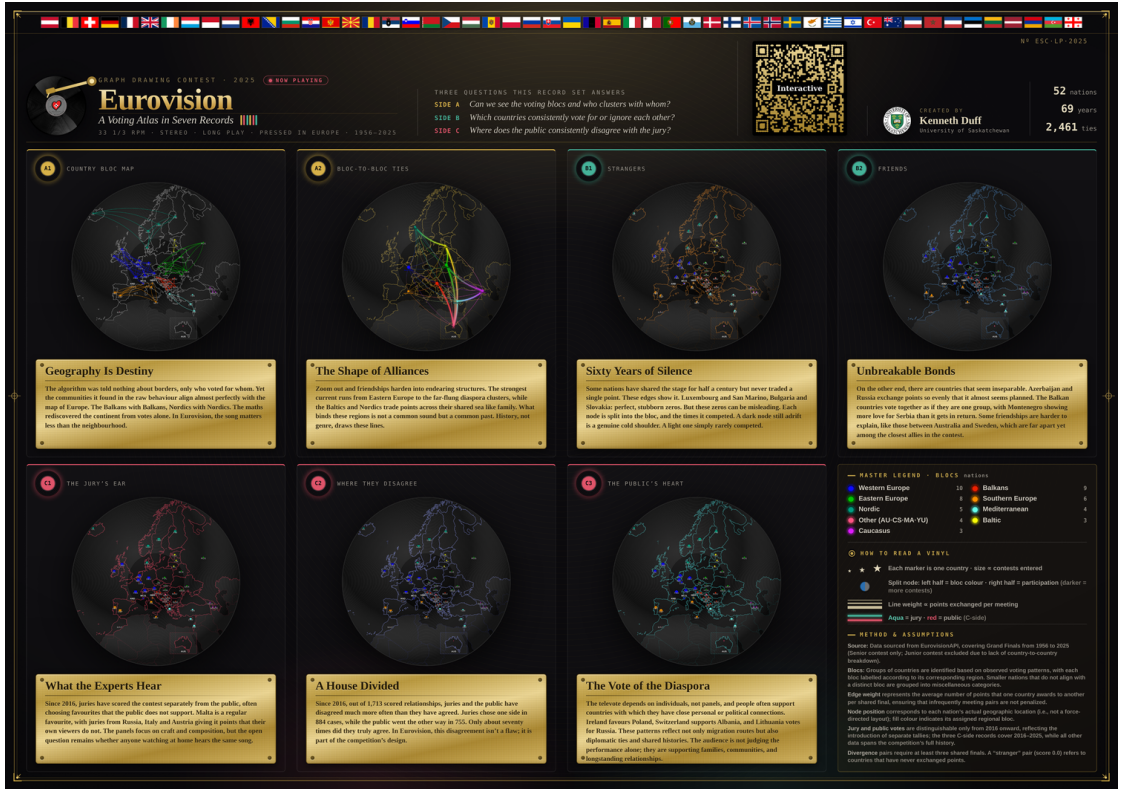
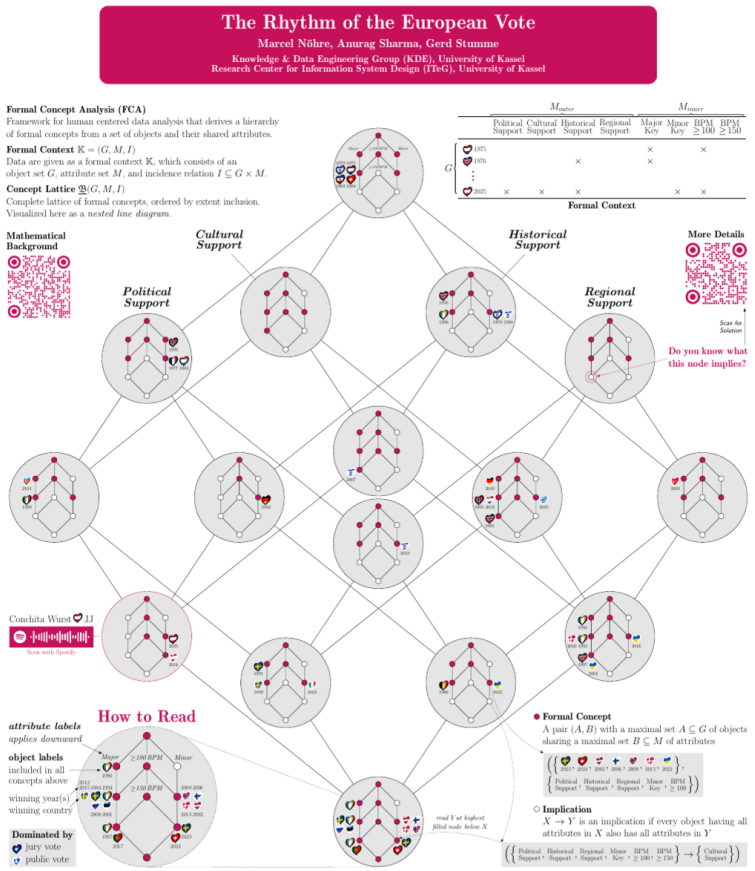


GRAPH DRAWING CONTEST

Creative Topic

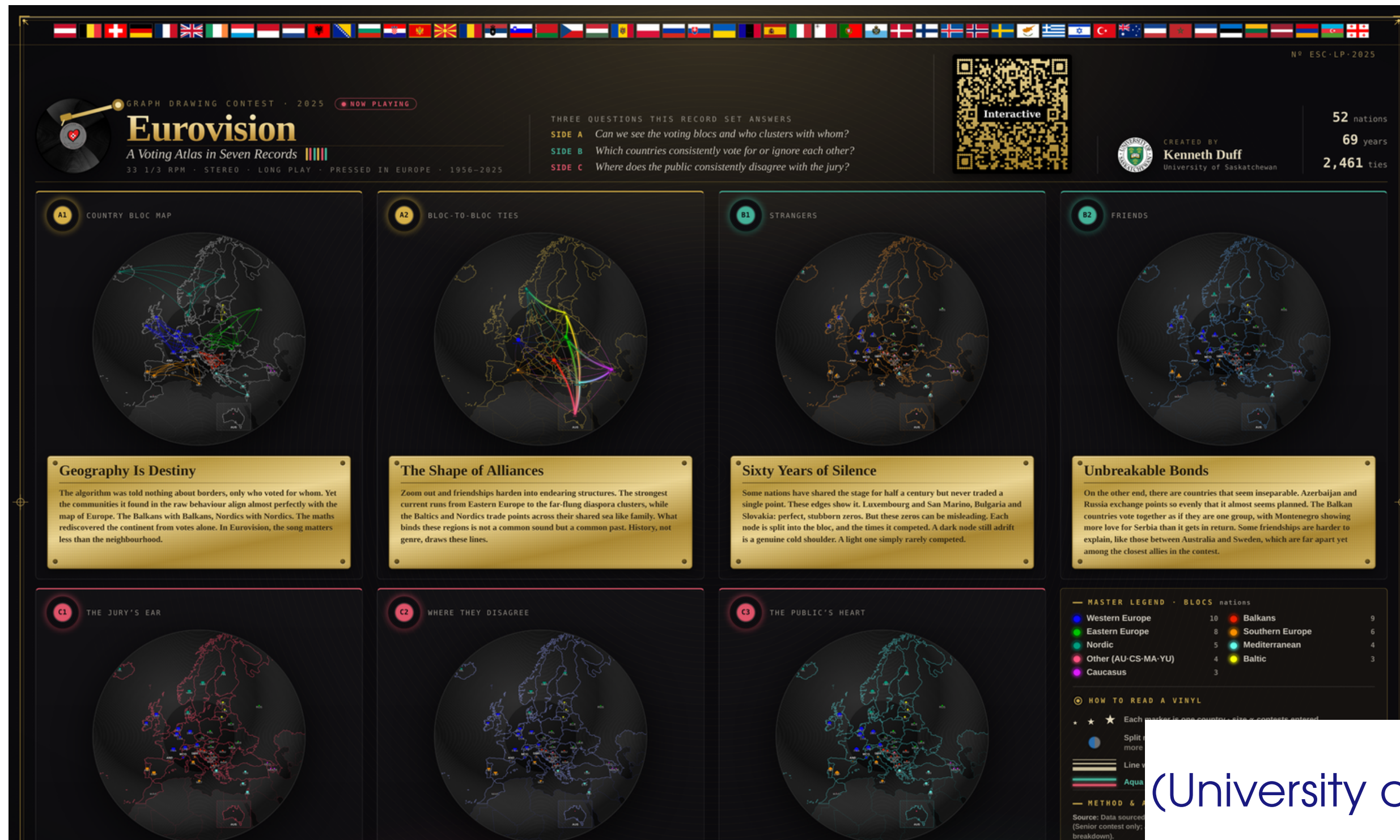


CREATIVE TOPIC
*The Eurovision
Song Contest*
Top 6



CREATIVE TOPIC

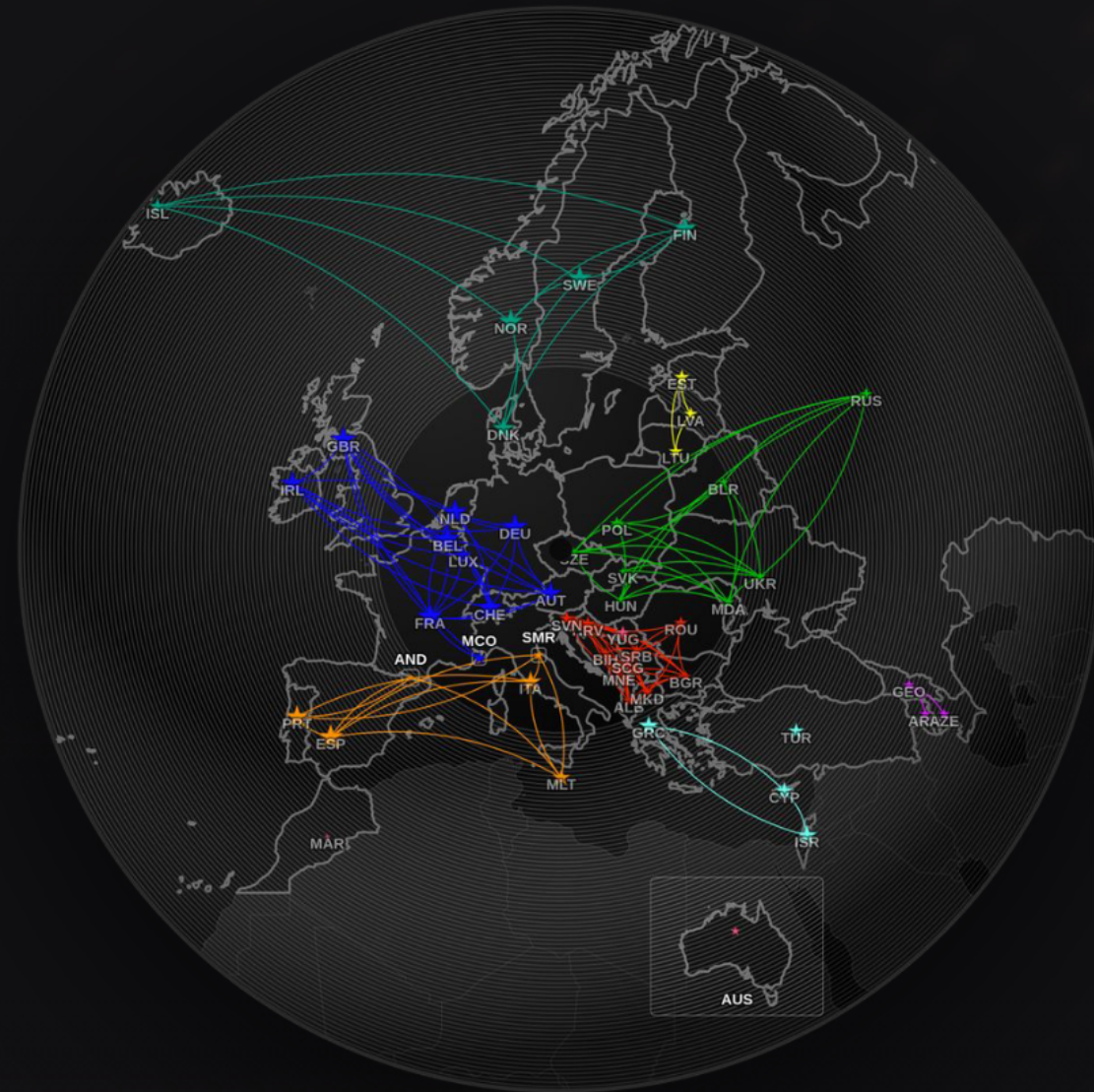
The Eurovision Song Contest 4th Place



Kenneth Duff
(University of Saskatchewan)

A1

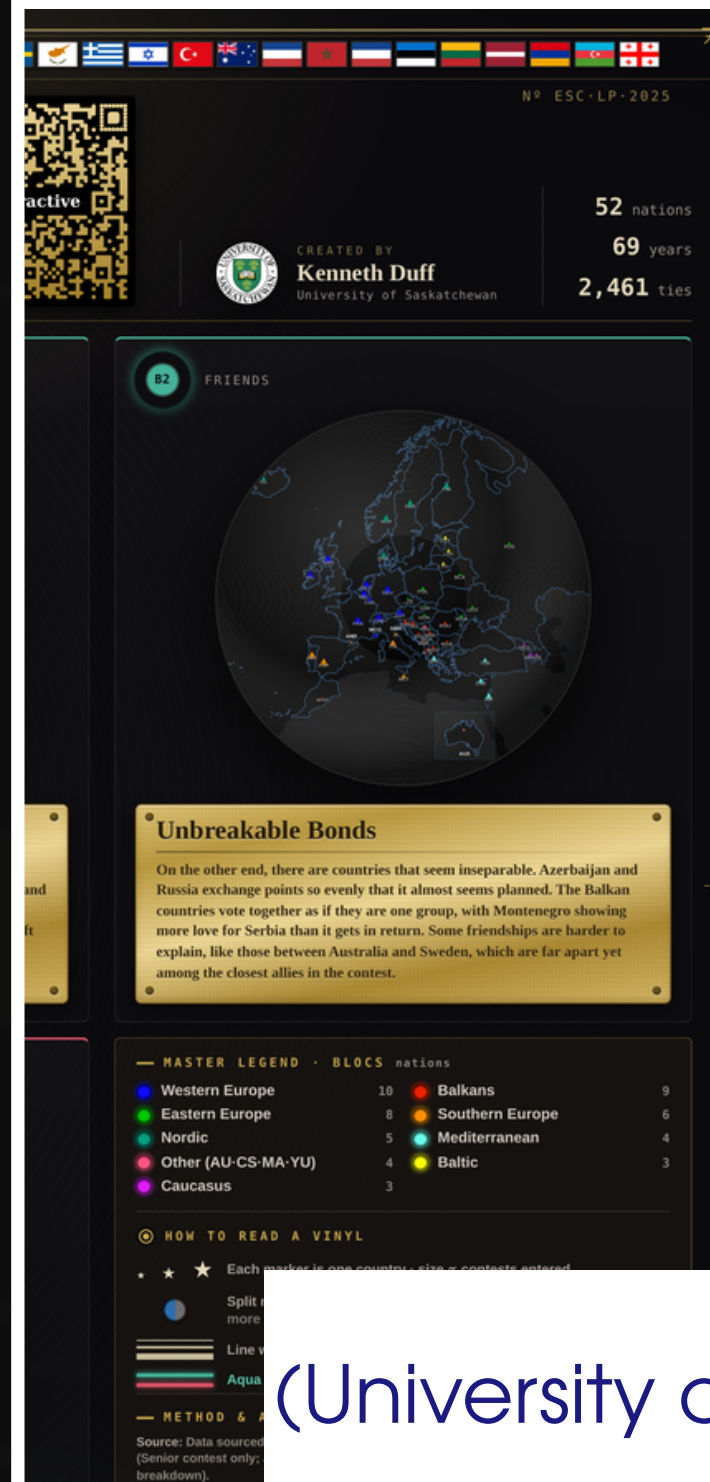
COUNTRY BLOC MAP



Geography Is Destiny

The algorithm was told nothing about borders, only who voted for whom. Yet the communities it found in the raw behaviour align almost perfectly with the map of Europe. The Balkans with Balkans, Nordics with Nordics. The maths rediscovered the continent from votes alone. In Eurovision, the song matters less than the neighbourhood.

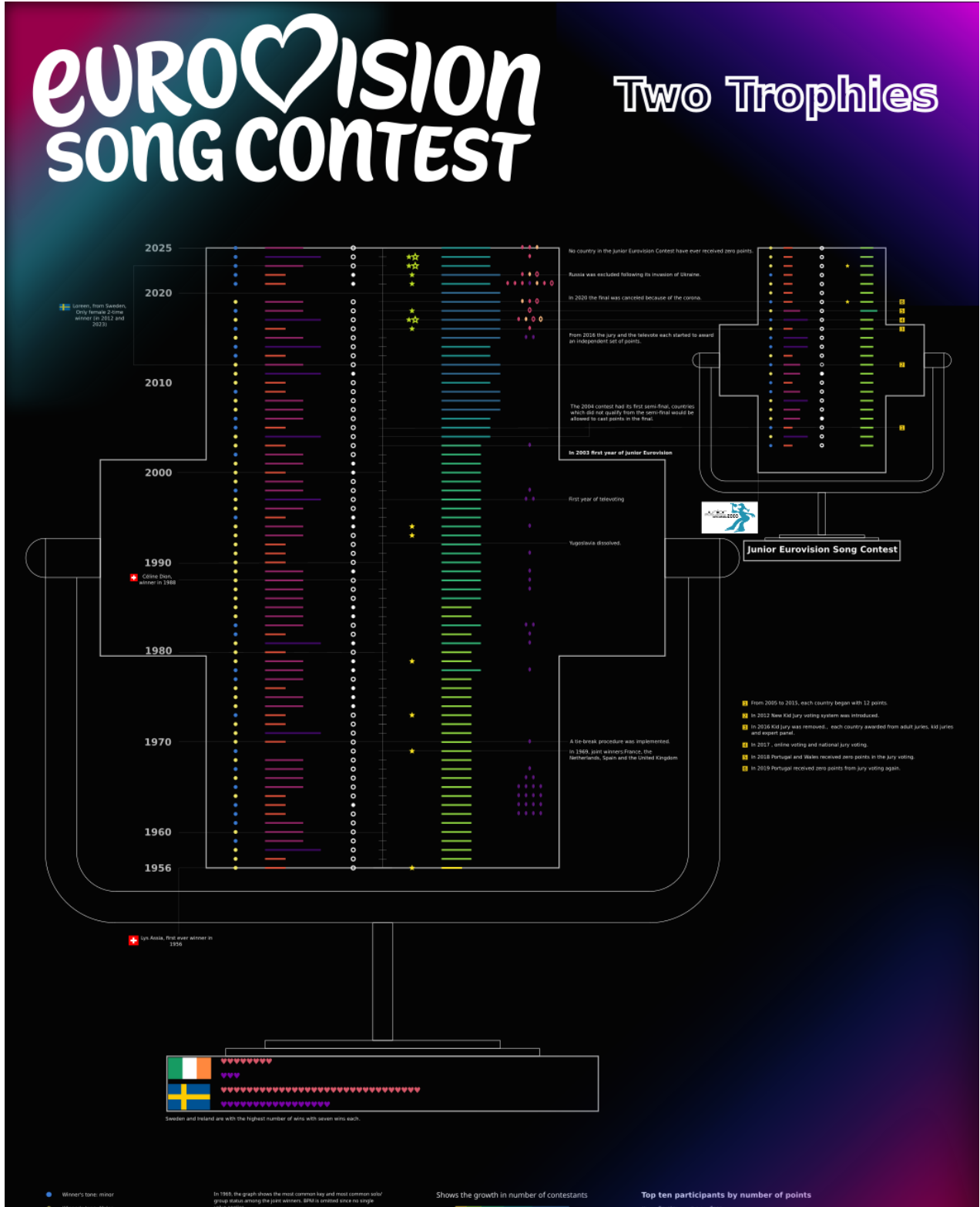
Contest



Kenneth Duff
(University of Saskatchewan)

The Eurovision Song Contest

4th Place

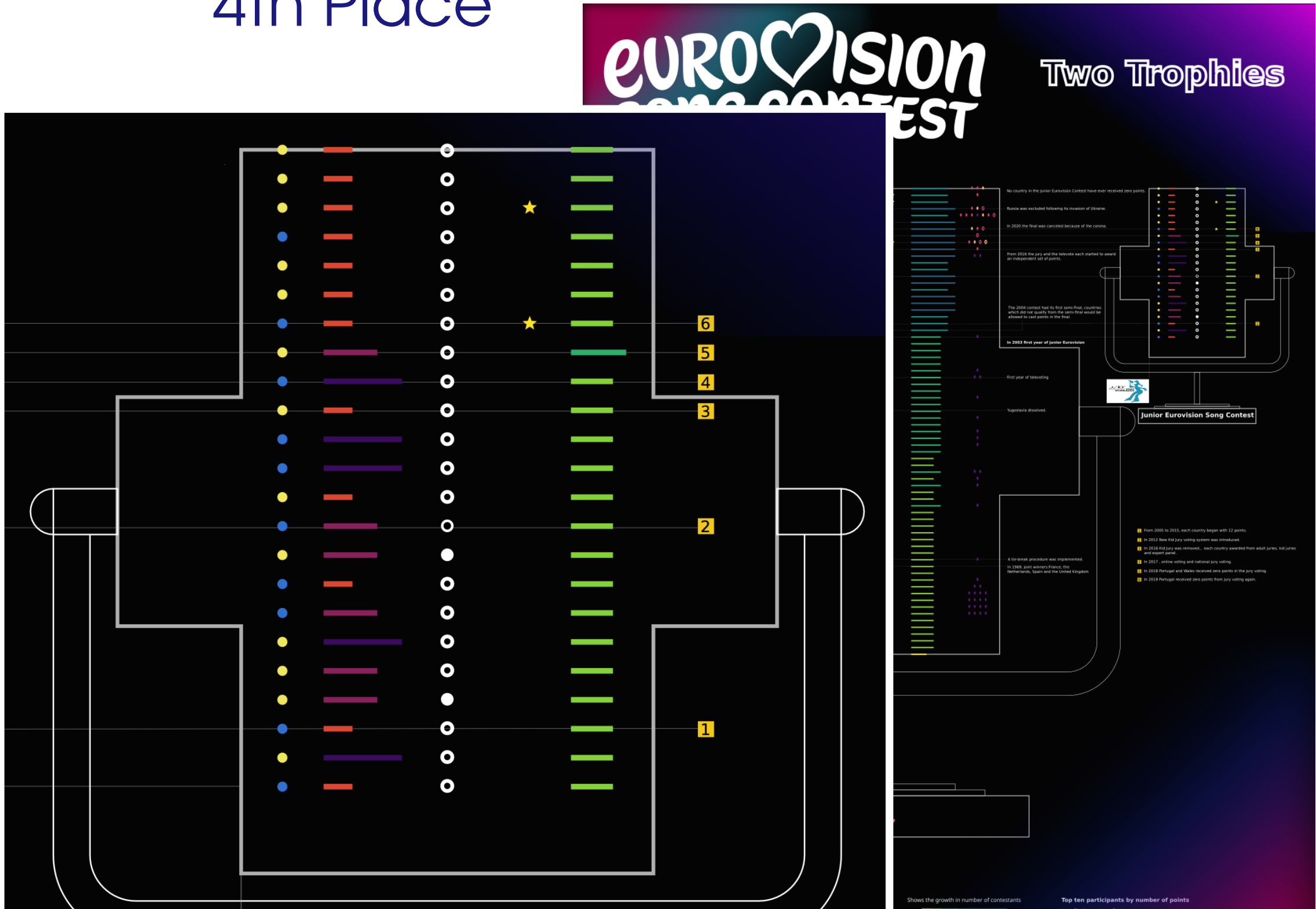


Lin Ye
(Germany)

CREATIVE TOPIC

The Eurovision Song Contest

4th Place



Lin Ye
(Germany)

CREATIVE TOPIC

The Eurovision Song Contest

4th Place

NETWORK COMMUNITY DETECTION · EUROVISION · DATA ANALYSIS

TU Sixty Years of Eurovision Voting Blocs

How national voting allegiances cluster, fracture and re-form across the contest, from 1957 to 2022

Alphab.: Hagendorfer Simon, Kaufmann Thea & Wegendt Ellen · [e12008552, e12002221, e12530032]@student.tuwien.ac.at

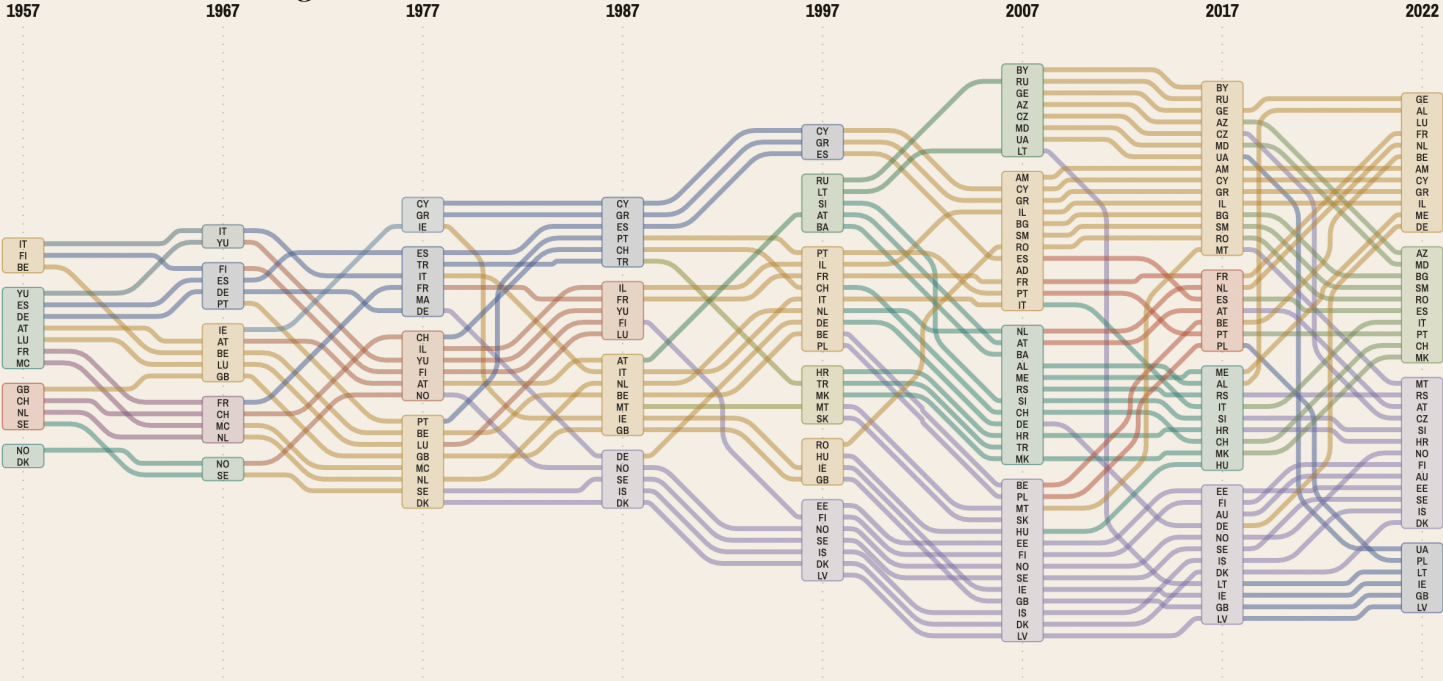
ABSTRACT

Each contest is treated as a directed, weighted network in which juries and televoters award points to one another, and we analyzed the *voting communities* in decade intervals. Tracing these communities forward reveals coherent blocs that persist for generations — a stable Nordic–Atlantic core, a Mediterranean cluster, and an Eastern bloc that consolidates sharply after 2000.

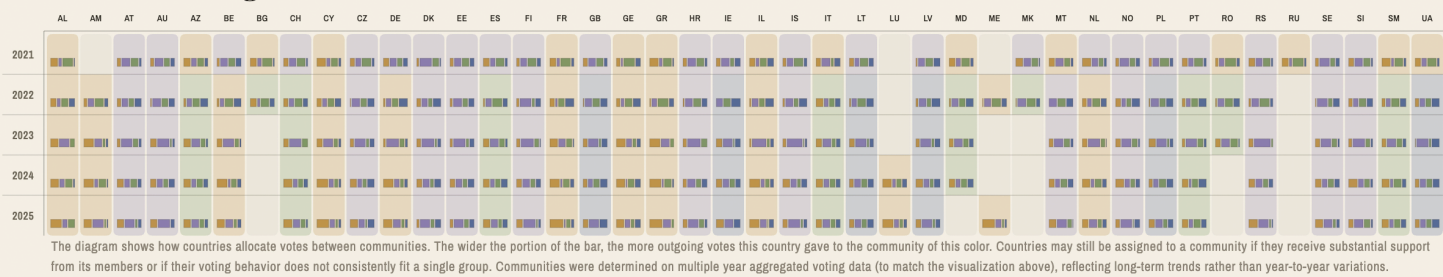


online visualization
and resources

I The evolution of voting communities



II Cross-bloc voting in the recent contests



THE BLOCS — 2022

- Western & Mediterranean**
GE AL LU FR NL BE AM CY GR IL ME DE
- Southern & Eastern**
AZ MD BG SM RO ES IT PT CH MK
- Nordic & Central**
MT RS AT CZ SI HR NO FI AU EE SE IS DK
- Atlantic & Eastern frontier**
UA PL LT IE GB LV

Colours trace each bloc's lineage backward through the decades by membership overlap.

HOW TO READ IT

Panel I — every country is a thread. Where threads bundle into a coloured block, those countries formed one community for that decade. Follow a colour left→right to watch a bloc survive, absorb or shed members.

Panel II — each column is a country; background colour shows its community for that contest year. The stacked bar in each cell shows the distribution of jury and public points it awarded, broken down by recipient community, 2021–2025.

KEY FINDINGS

- 01** A Nordic–Baltic community is the most durable structure in the contest, recognisable in every snapshot from the 1980s onward.
- 02** An Eastern–European bloc crystallises after 2000 as the contest expands, growing to fifteen members by 2017.

METHOD

There are two phases: We first found those pairs of countries that voted for each other more than we would expect (i.e. some behaviour that can't be explained by chance) using a simulation. Then we ran a community detection algorithm on the resulting graph, which finds out where there is a lot of collusion (voting for each other) in comparison to all the voting behaviour in the graph.

Hagendorfer Simon
Kaufmann Thea
Wegendt Ellen
(TU Wien)

CREATIVE TOPIC

The Eurovision Song

4th Place

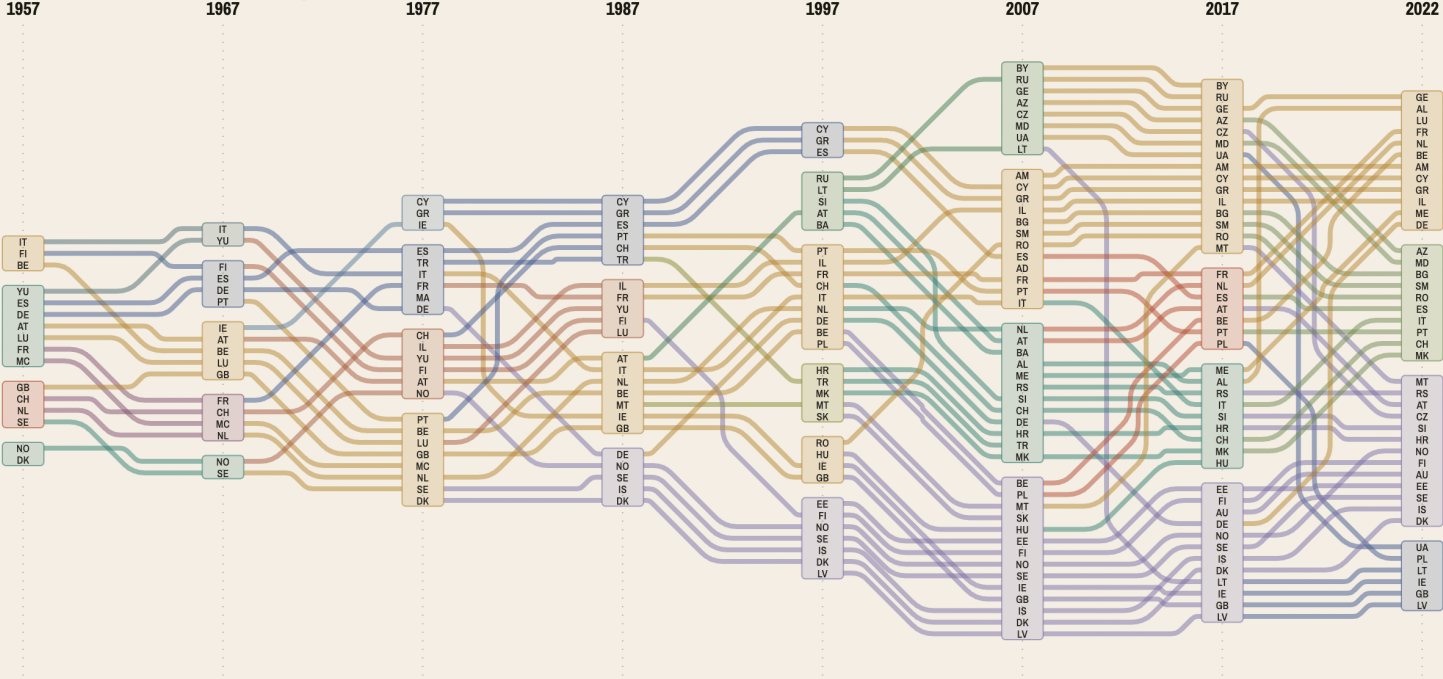
NETWORK COMMUNITY DETECTION · EUROVISION · DATA ANALYSIS

TU Sixty Years of Eurovision Voting Blocs

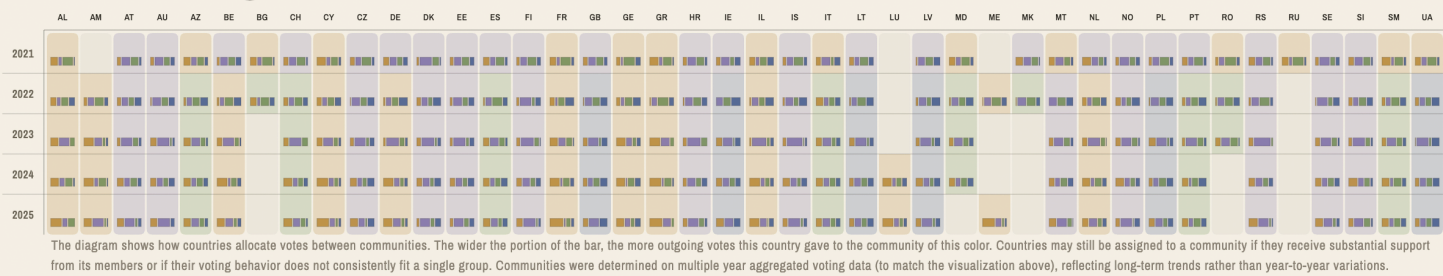
How national voting allegiances cluster, fracture and re-form across the contest, from 1957 to 2022

Alphab.: Hagendorfer Simon, Kaufmann Thea & Wegendt Ellen · [e12008552, e12002221, e12530032]@student.tuwien.ac.at

I The evolution of voting communities



II Cross-bloc voting in the recent contests



ABSTRACT

Each contest is treated as a directed, weighted network in which jurors award points to one another, and we analyzed the voting communities in decade intervals. Tracing these communities forward reveals cohorts that persist for generations — a stable Nordic–Atlantic core, a Mediterranean cluster, and an Eastern bloc that consolidates sharply after 2000.

THE BLOCS — 2022

- Western & Med**
GE AL LU FR NL BE AM CY GR IL ME DE
- Southern & Eastern**
AZ MD BG SM RO ES IT PT CH MK
- Nordic & Central**
MT RS AT CZ SI HR NO FI AU EE SE IS DK
- Atlantic & Eastern frontier**
UA PL LT IE GB LV

Colours trace each bloc's lineage backward through the decades by membership overlap.

HOW TO READ IT

Panel I — every country is a thread. Where threads bundle into a coloured block, those countries formed one community for that decade. Follow a colour left→right to watch a bloc survive, absorb or shed members.

Panel II — each column is a country; background colour shows its community for that contest year. The stacked bar in each cell shows the distribution of jury and public points it awarded, broken down by recipient community, 2021–2025.

KEY FINDINGS

- 01** A Nordic–Baltic community is the most durable structure in the contest, recognisable in every snapshot from the 1980s onward.
- 02** An Eastern–European bloc crystallises after 2000 as the contest expands, growing to fifteen members by 2017.

METHOD

There are two phases: We first found those pairs of countries that voted for each other more than we would expect (i.e. some behaviour that can't be explained by chance) using a simulation. Then we ran a community detection algorithm on the resulting graph, which finds out where there is a lot of collusion (voting for each other) in comparison to all the voting behaviour in the graph.

Hagendorfer Simon
Kaufmann Thea
Wegendt Ellen
(TU Wien)

CREATIVE TOPIC

The Eurovision Song

4th Place

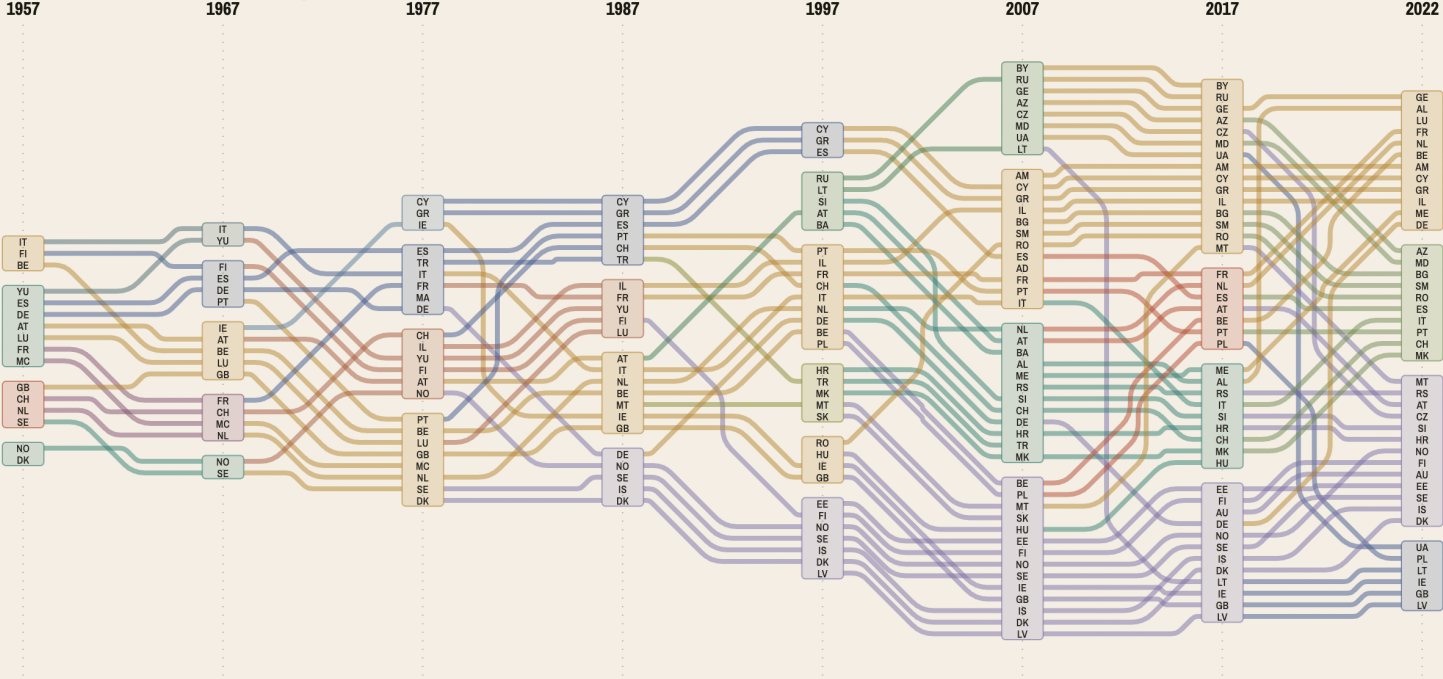
NETWORK COMMUNITY DETECTION · EUROVISION · DATA ANALYSIS

TU Sixty Years of Eurovision Voting Blocs

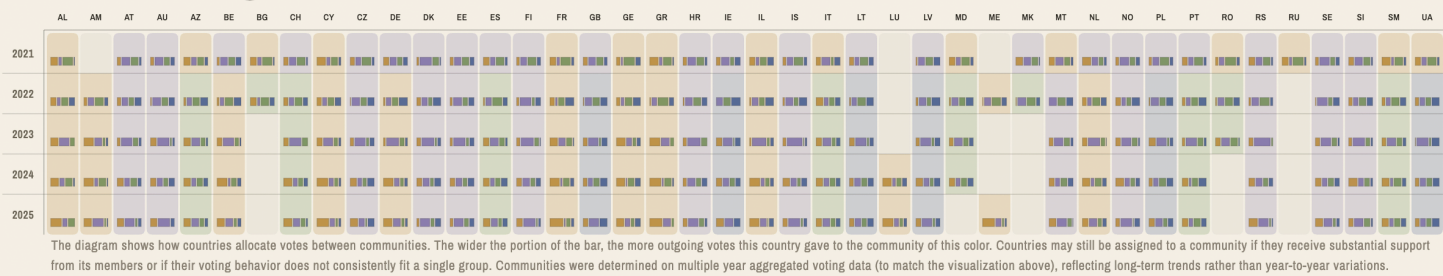
How national voting allegiances cluster, fracture and re-form across the contest, from 1957 to 2022

Alphab.: Hagendorfer Simon, Kaufmann Thea & Wegendt Ellen · [e12008552, e12002221, e12530032]@student.tuwien.ac.at

I The evolution of voting communities



II Cross-bloc voting in the recent contests



ABSTRACT

Each contest is treated as a directed, weighted network in which jurors award points to one another, and we analyzed the voting communities in decade intervals. Tracing these communities forward reveals cohorts that persist for generations — a stable Nordic–Atlantic core, a Mediterranean cluster, and an Eastern bloc that consolidates sharply after 2000.

THE BLOCS — 2022

- Western & Med**
GE AL LU FR NL BE AM CY GR IL ME DE
- Southern & Eastern**
AZ MD BG SM RO ES IT PT CH MK
- Nordic & Central**
MT RS AT CZ SI HR NO FI AU EE SE IS DK
- Atlantic & Eastern frontier**
UA PL LT IE GB LV

Colours trace each bloc's lineage backward through the decades by membership overlap.

HOW TO READ IT

Panel I — every country is a thread. Where threads bundle into a coloured block, those countries formed one community for that decade. Follow a colour left→right to watch a bloc survive, absorb or shed members.

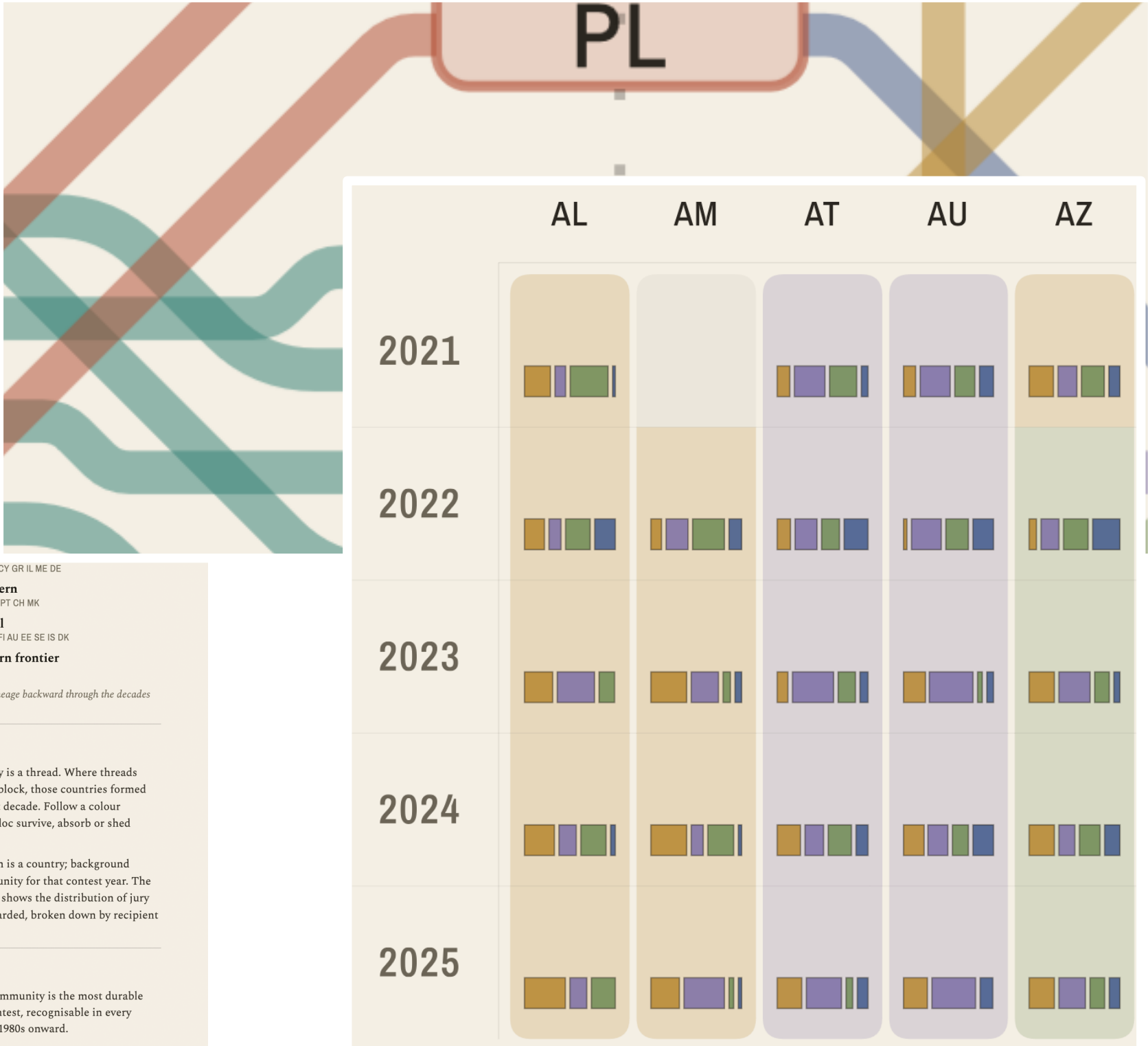
Panel II — each column is a country; background colour shows its community for that contest year. The stacked bar in each cell shows the distribution of jury and public points it awarded, broken down by recipient community, 2021–2025.

KEY FINDINGS

- 01** A Nordic–Baltic community is the most durable structure in the contest, recognisable in every snapshot from the 1980s onward.
- 02** An Eastern–European bloc crystallises after 2000 as the contest expands, growing to fifteen members by 2017.

METHOD

There are two phases: We first found those pairs of countries that voted for each other more than we would expect (i.e. some behaviour that can't be explained by chance) using a simulation. Then we ran a community detection algorithm on the resulting graph, which finds out where there is a lot of collusion (voting for each other) in comparison to all the voting behaviour in the graph.



Hagendorfer Simon
Kaufmann Thea
Wegendt Ellen
(TU Wien)

The Rhythm of the European Vote

Marcel Nöhre, Anurag Sharma, Gerd Stumme
Knowledge & Data Engineering Group (KDE), University of Kassel
Research Center for Information System Design (ITeG), University of Kassel

Formal Concept Analysis (FCA)

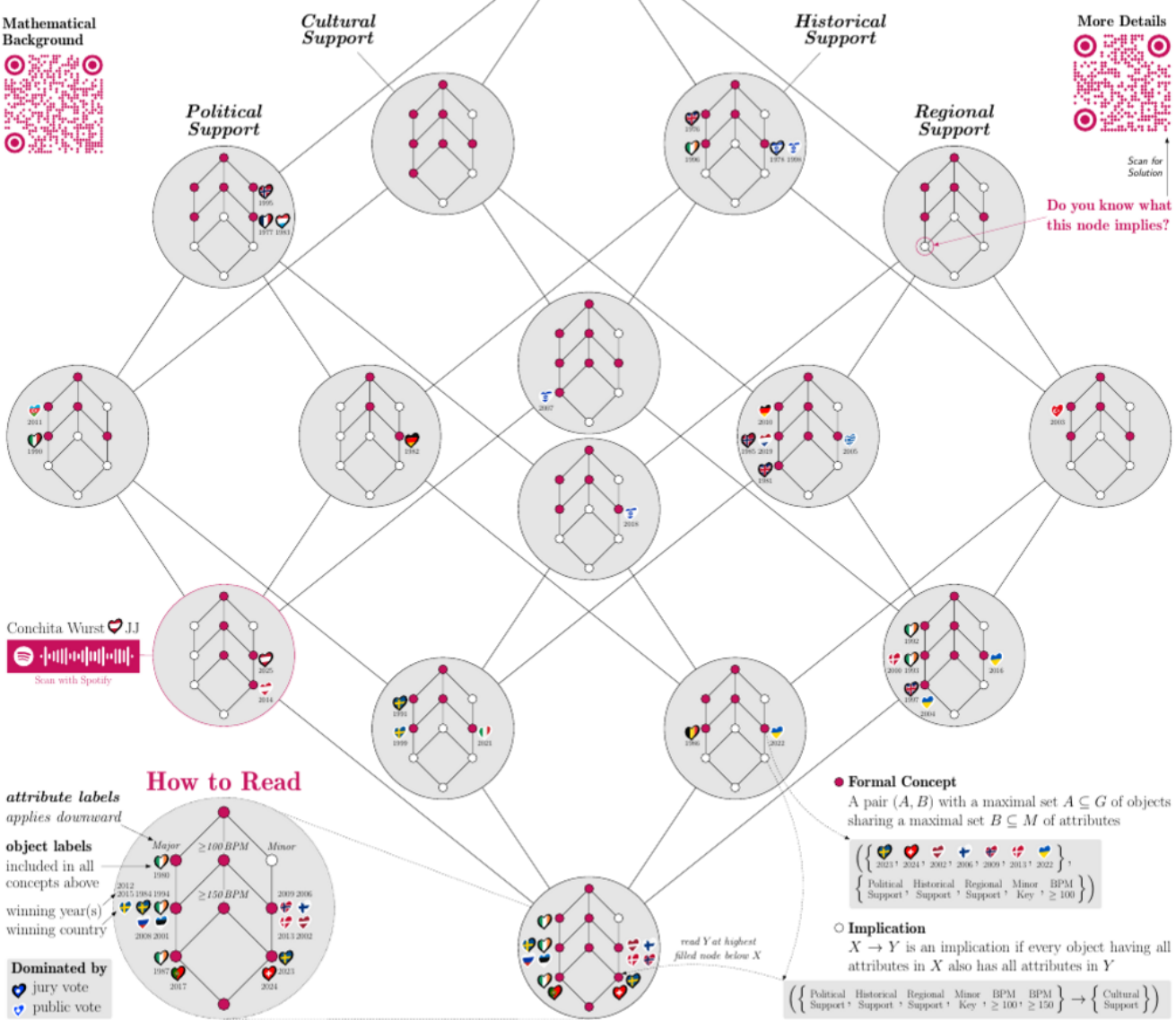
Framework for human centered data analysis that derives a hierarchy of formal concepts from a set of objects and their shared attributes.

Formal Context $\mathbb{K} = (G, M, I)$

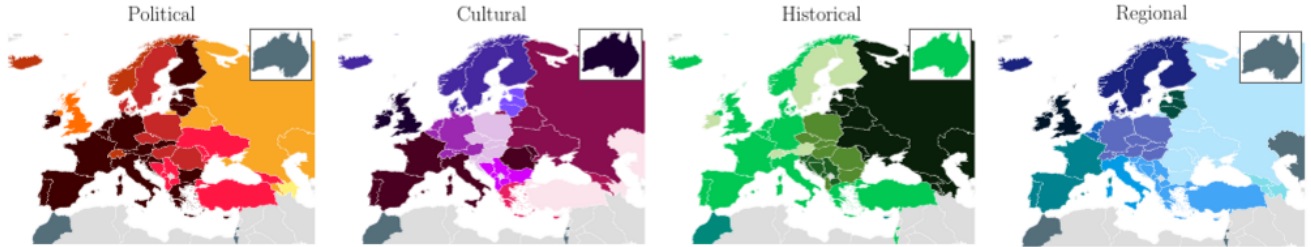
Data are given as a formal context $\mathbb{K}$, which consists of an object set G , attribute set M , and incidence relation $I \subseteq G \times M$.

Concept Lattice $\mathfrak{B}(\mathbb{K})$

Complete lattice of formal concepts, ordered by extent inclusion. Visualized here as a *nested line diagram*.



Clusters



Note: A winning song is considered supported by a cluster if the average points awarded by all countries within the same cluster that were eligible to vote in that year is ≥ 8 .

CREATIVE TOPIC
The Eurovision Song Contest

3rd Place
Marcel Nöhre
Anurag Sharma
Gerd Stumme
(University of Kassel)

The Rhythm of the European Vote

Marcel Nöhre, Anurag Sharma, Gerd Stumme

Knowledge & Data Engineering Group (KDE), University of Kassel
Research Center for Information System Design (ITeG), University of Kassel

Formal Concept Analysis (FCA)

Framework for human centered data analysis that derives a hierarchy of formal concepts from a set of objects and their shared attributes.

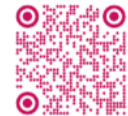
Formal Context $\mathbb{K} = (G, M, I)$

Data are given as a formal context $\mathbb{K}$, which consists of an object set G , attribute set M , and incidence relation $I \subseteq G \times M$.

Concept Lattice $\mathfrak{B}(\mathbb{K})$

Complete lattice of formal concepts, ordered by extent inclusion. Visualized here as a *nested line diagram*.

Mathematical Background

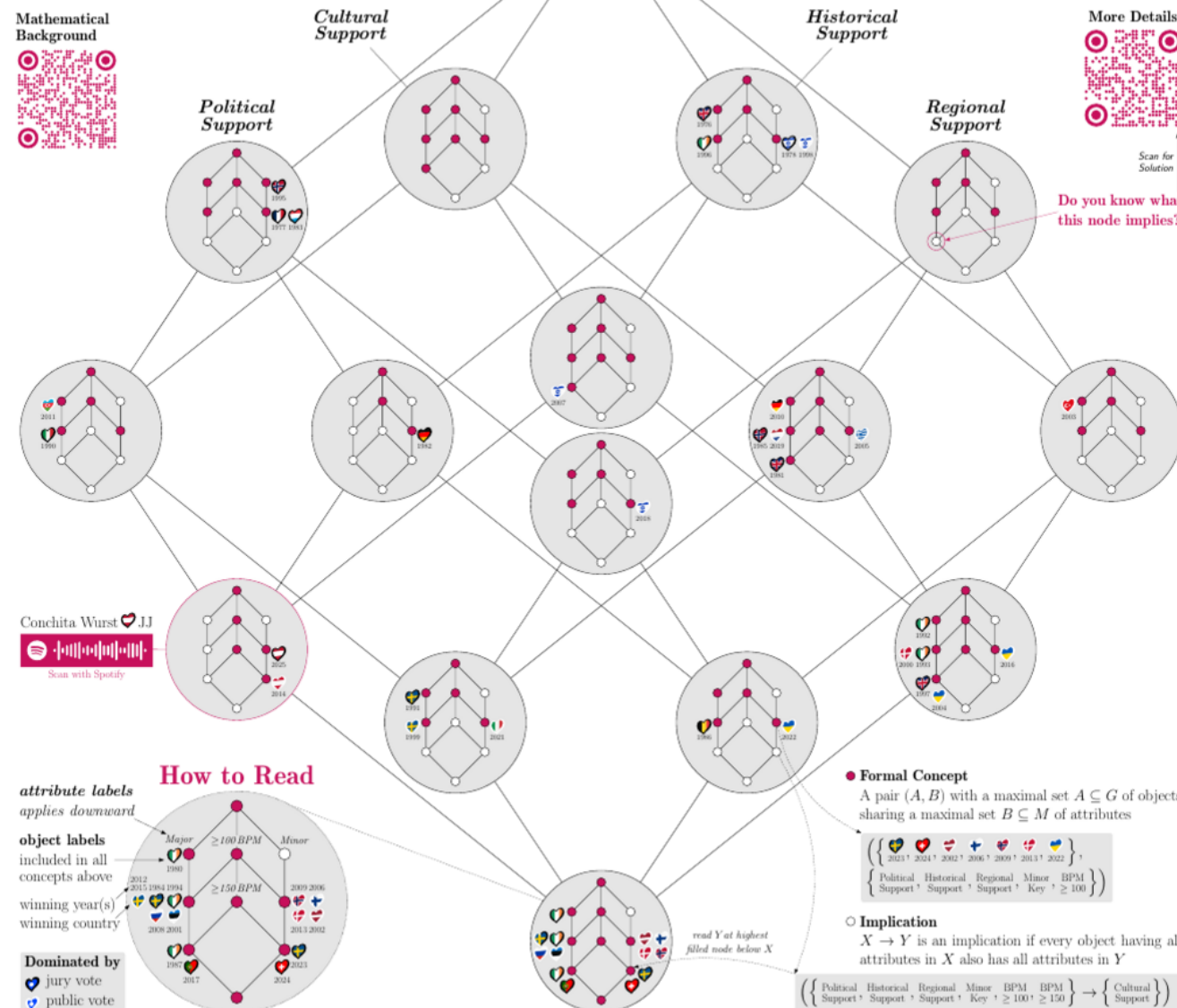


Cultural Support

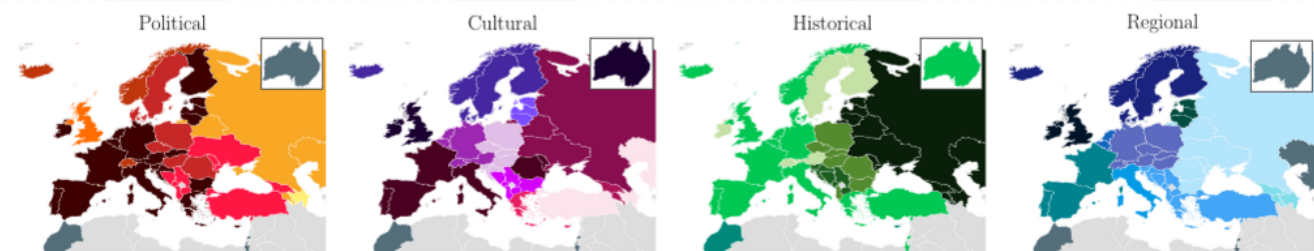
Historical Support

More Details

Do you know what this node implies?



Clusters



Note: A winning song is considered supported by a cluster if the average points awarded by all countries within the same cluster that were eligible to vote in that year is ≥ 8 .

CREATIVE TOPIC

The Eurovision Song Contest

How to Read

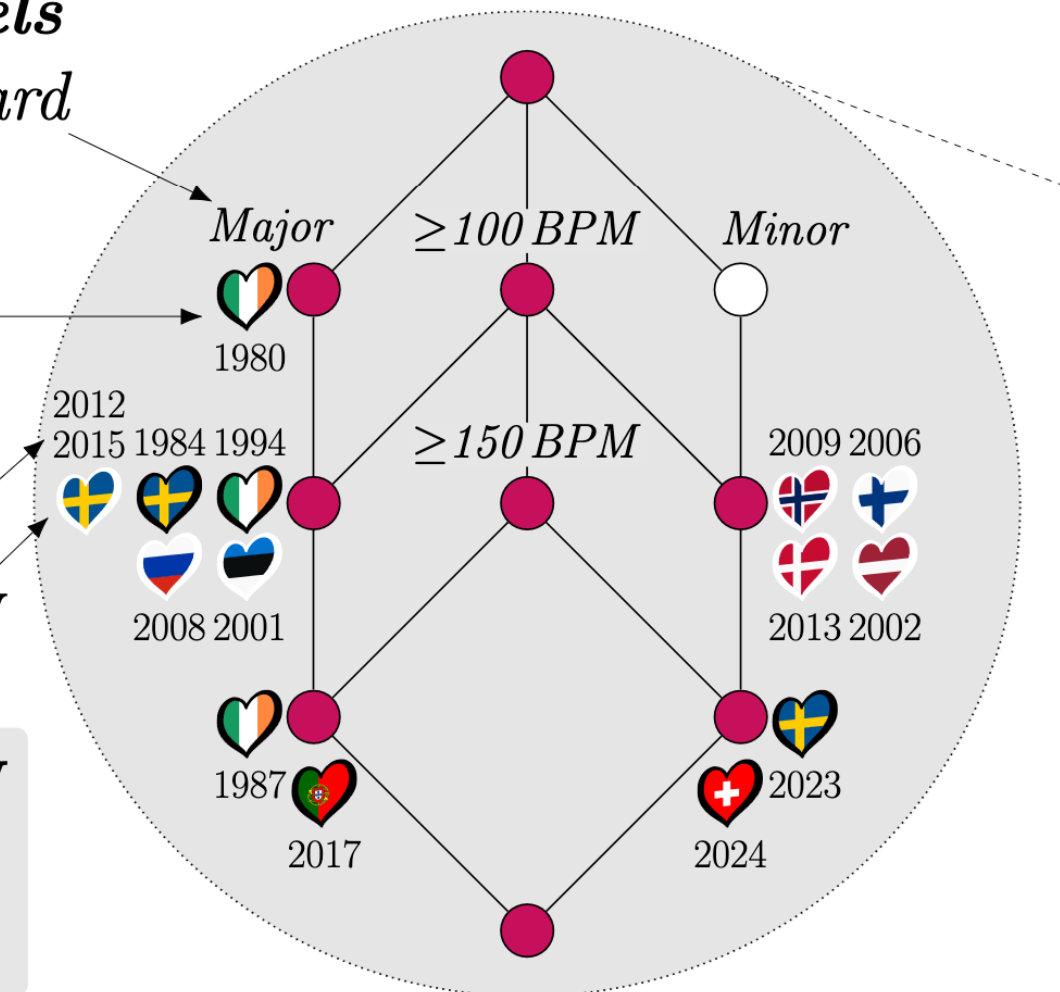
attribute labels
applies downward

object labels
included in all
concepts above

winning year(s)
winning country

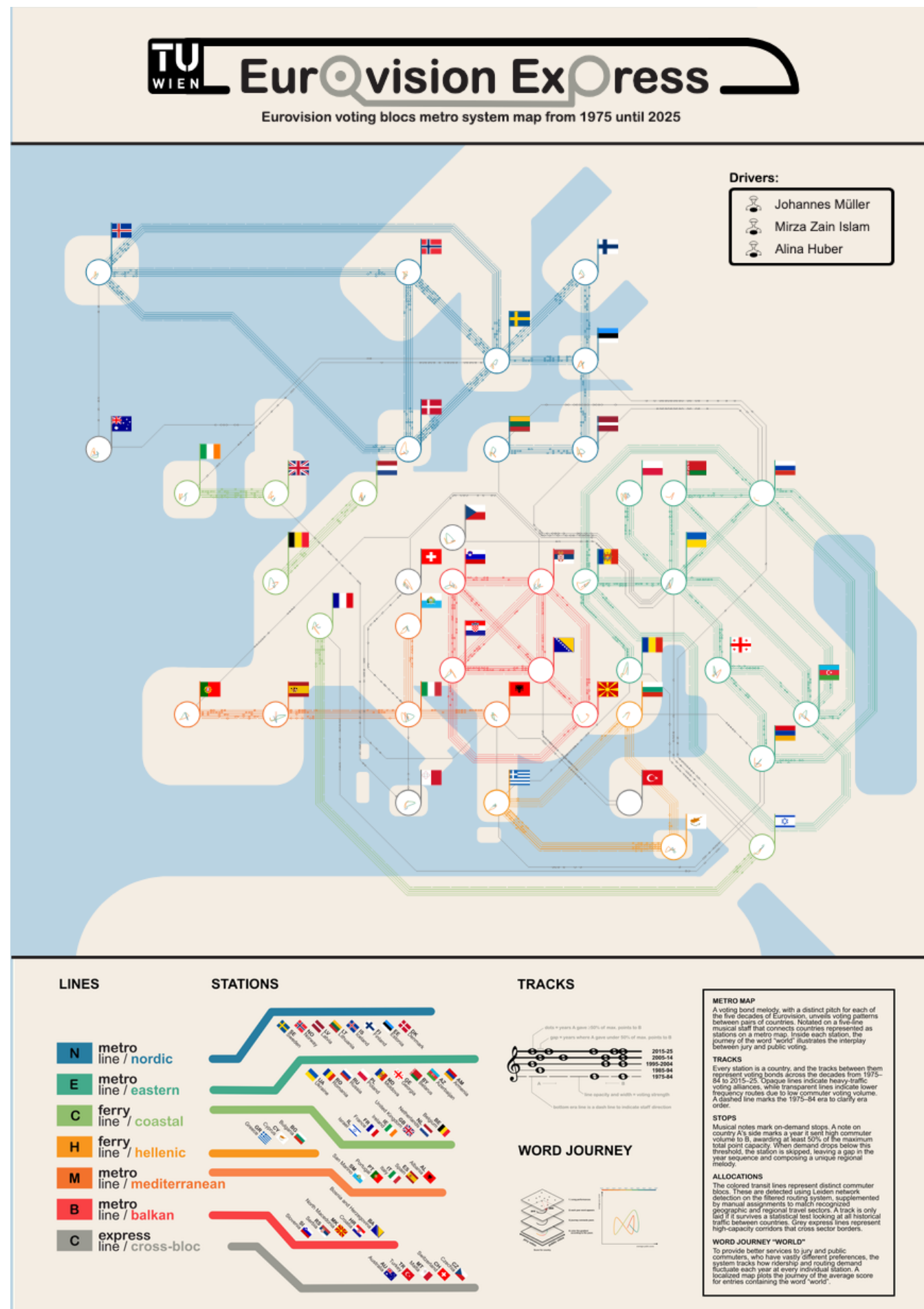
Dominated by

jury vote
public vote



3rd Place

Marcel Nöhre
Anurag Sharma
Gerd Stumme
(University of Kassel)

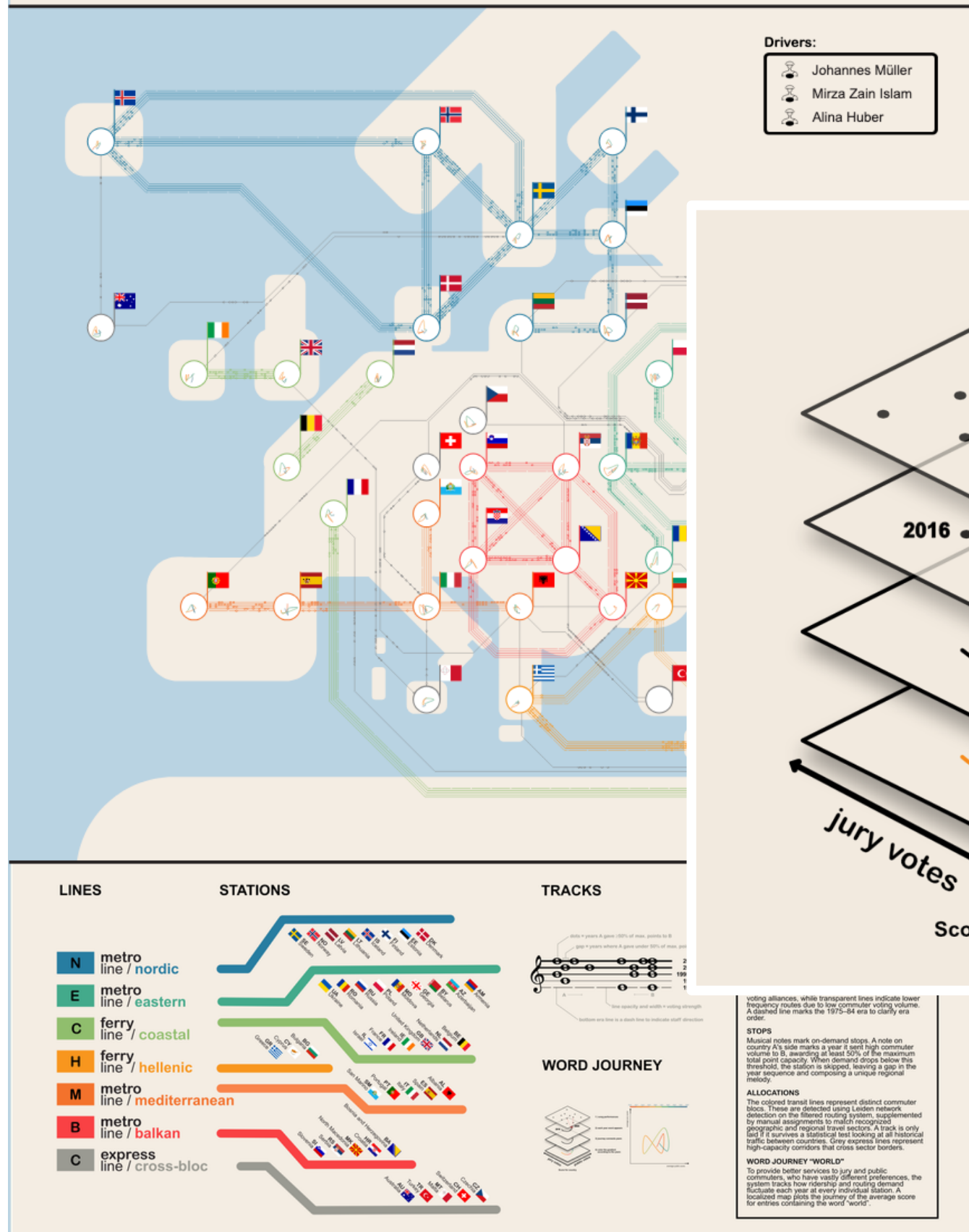


CREATIVE TOPIC

The Eurovision Song Contest

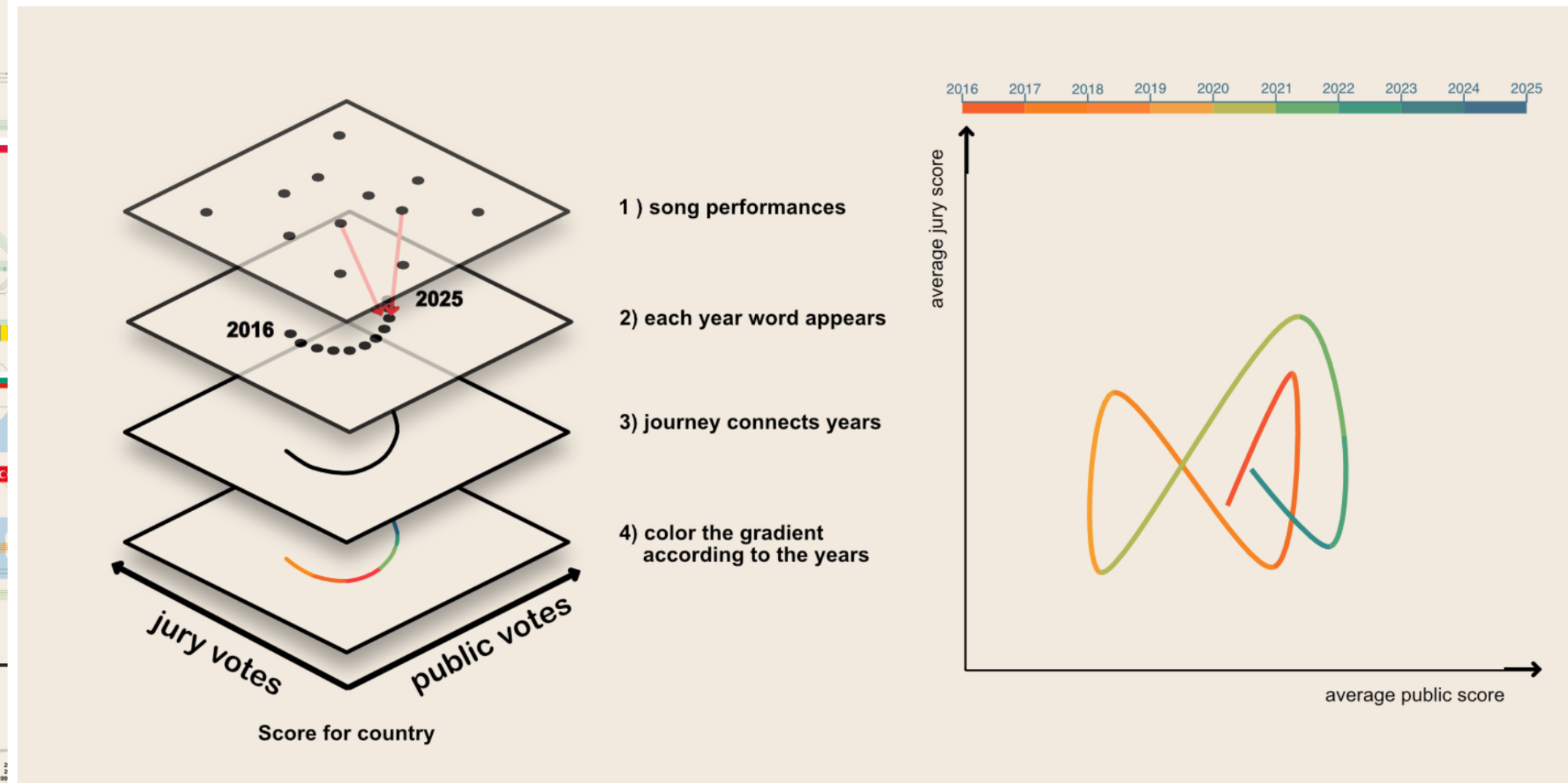
Johannes Müller
Mirzan Zain Islam
Alina Huber
(TU Wien)

2nd Place



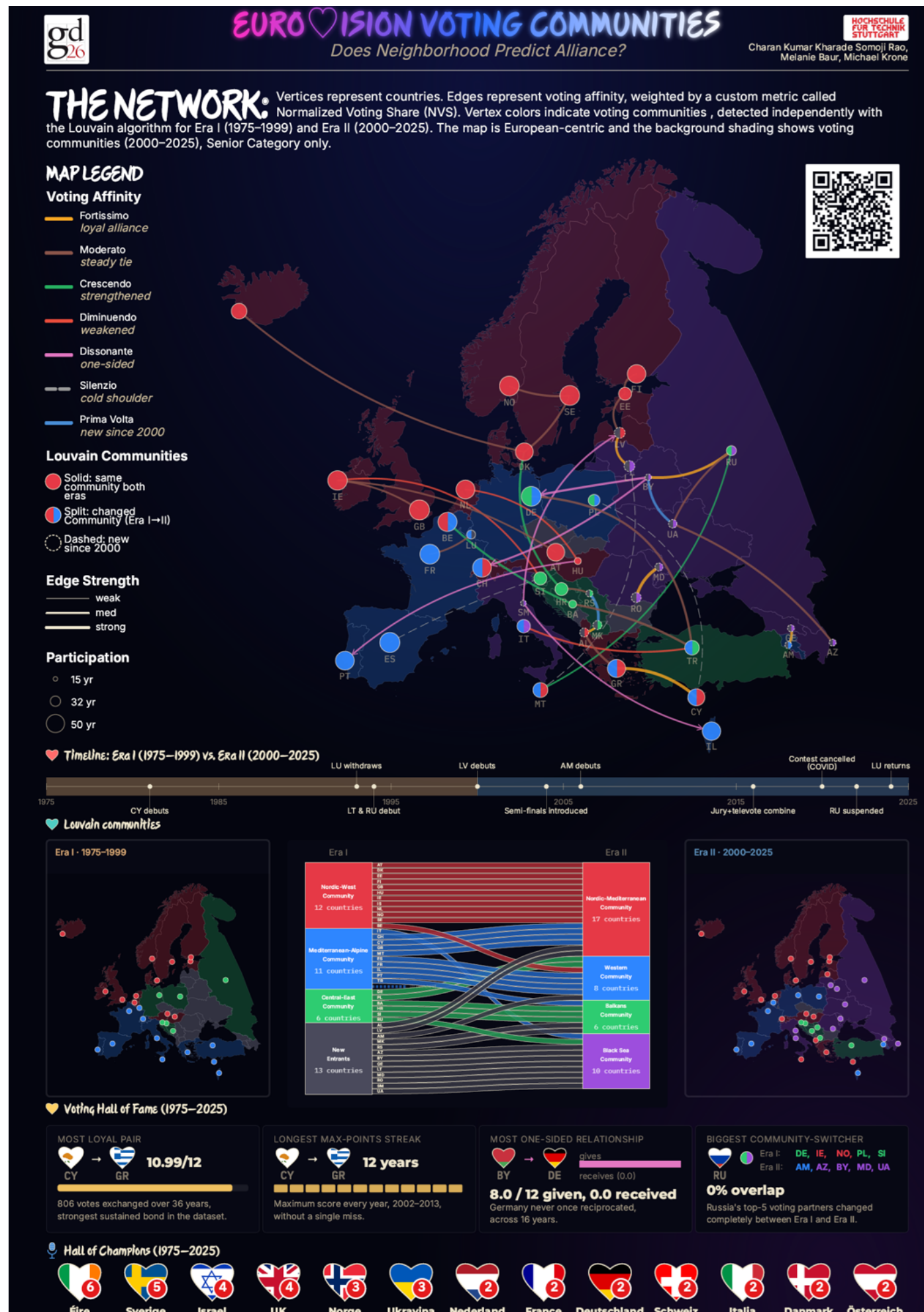
CREATIVE TOPIC

The Eurovision Song Contest



Johannes Müller
Mirzan Zain Islam
Alina Huber
(TU Wien)

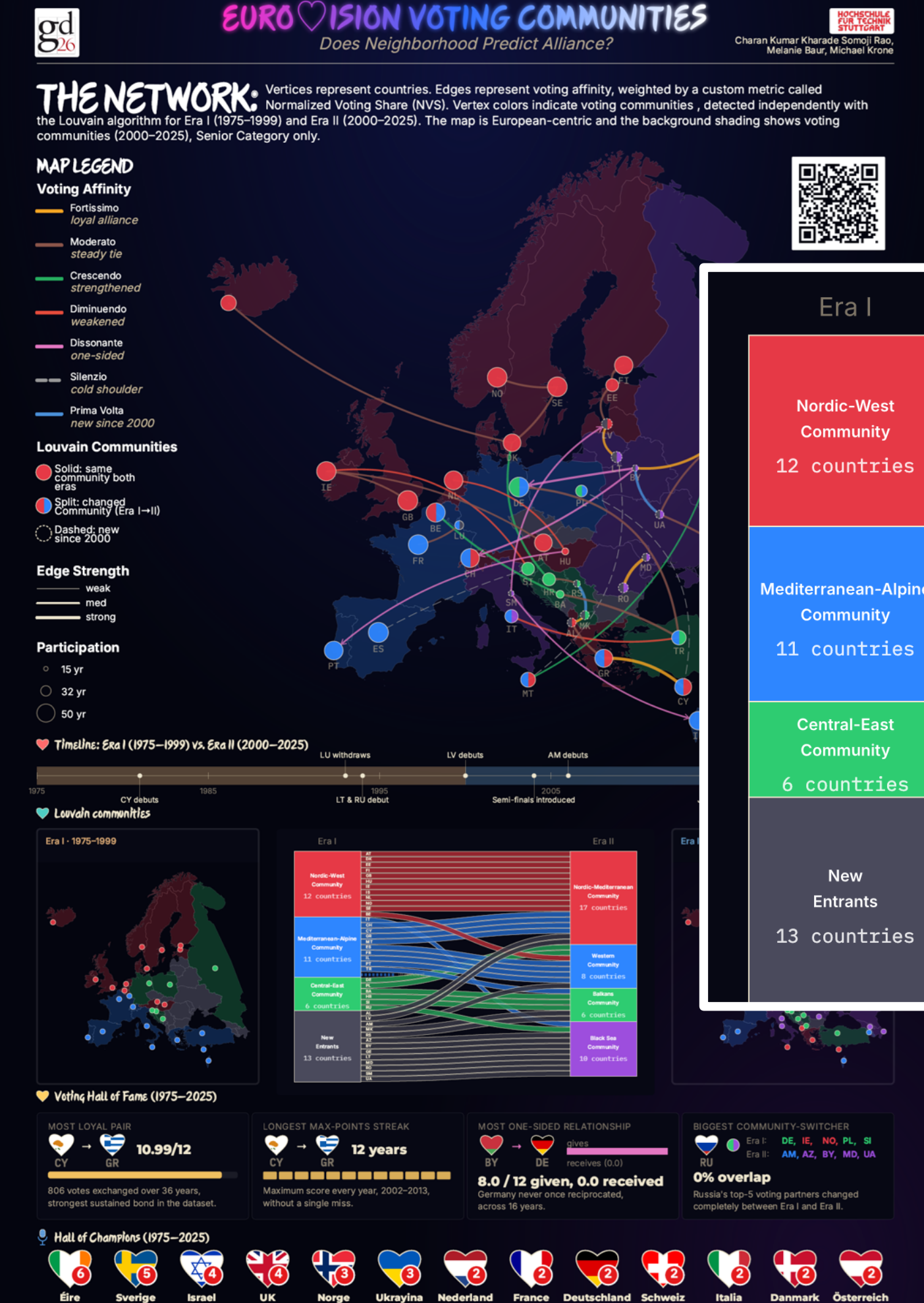
2nd Place



CREATIVE TOPIC

The Eurovision Song Contest

Charan Kumar Kharade
↪ Somoji Rao
Melanie Baur
Michael Krone
1st Place (HFT Stuttgart)



CREATIVE TOPIC

The Eurovision Song Contest

Charan Kumar Kharade
→ Somoji Rao
Melanie Baur
Michael Krone
1st Place (HFT Stuttgart)

LIVE CHALLENGE

LIVE CHALLENGE

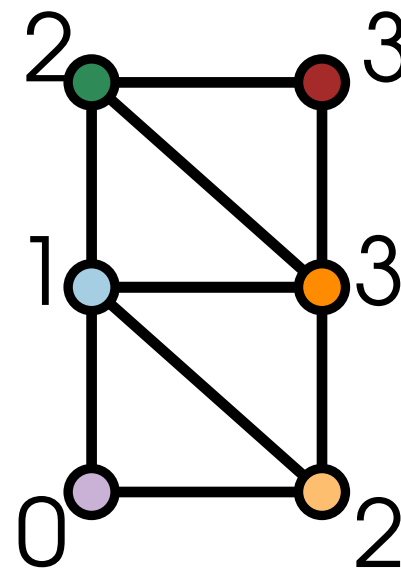
Compute k -planar drawings

- input: a graph G
- output: k -planar straight-line drawing of G
- objective: minimize k

LIVE CHALLENGE

Compute k -planar drawings

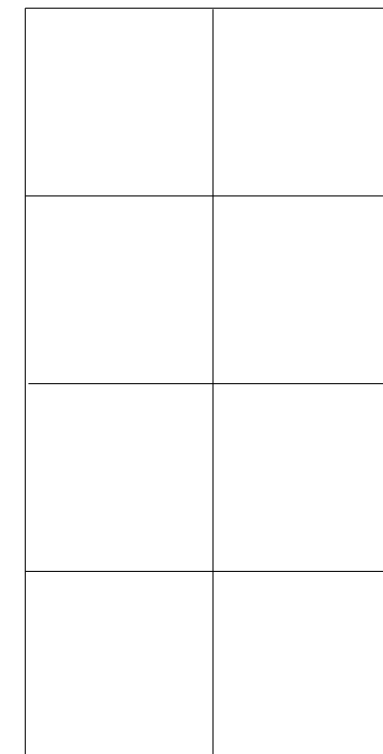
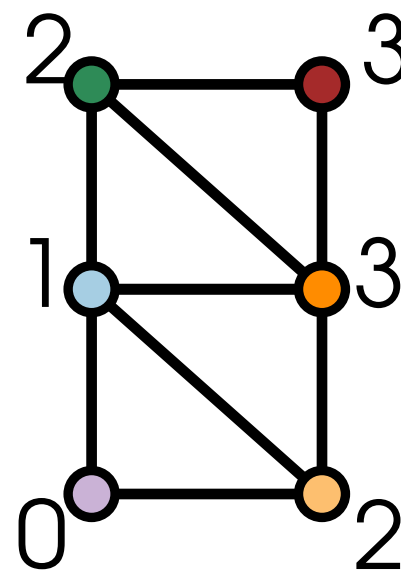
- input: a graph G
- output: k -planar straight-line drawing of G
- objective: minimize k



LIVE CHALLENGE

Compute k -planar drawings

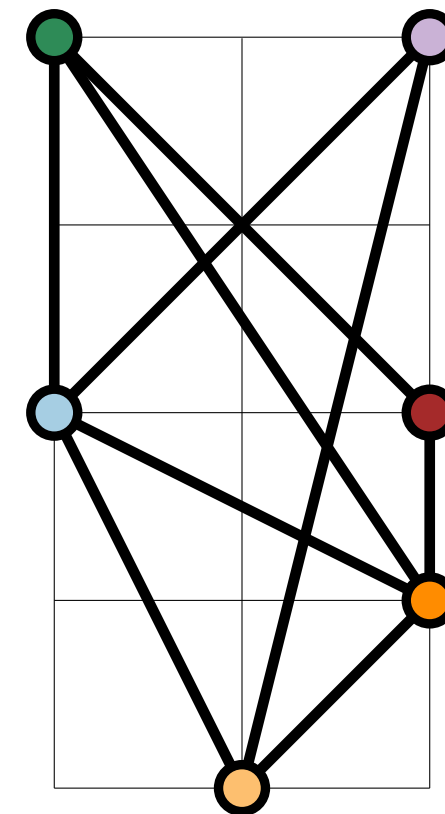
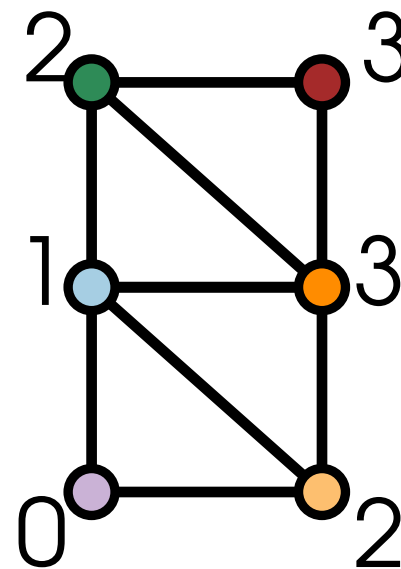
- input: a graph G
- output: k -planar straight-line drawing of G
- objective: minimize k



LIVE CHALLENGE

Compute k -planar drawings

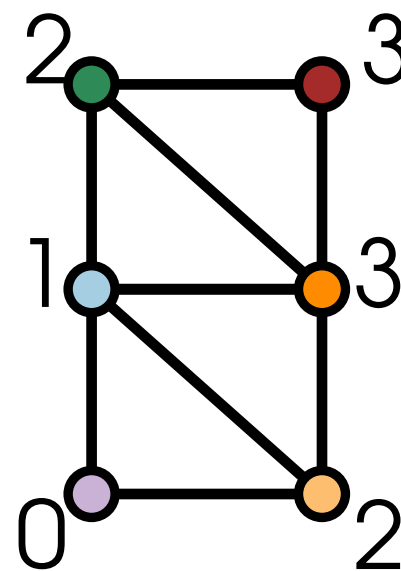
- input: a graph G
- output: k -planar straight-line drawing of G
- objective: minimize k



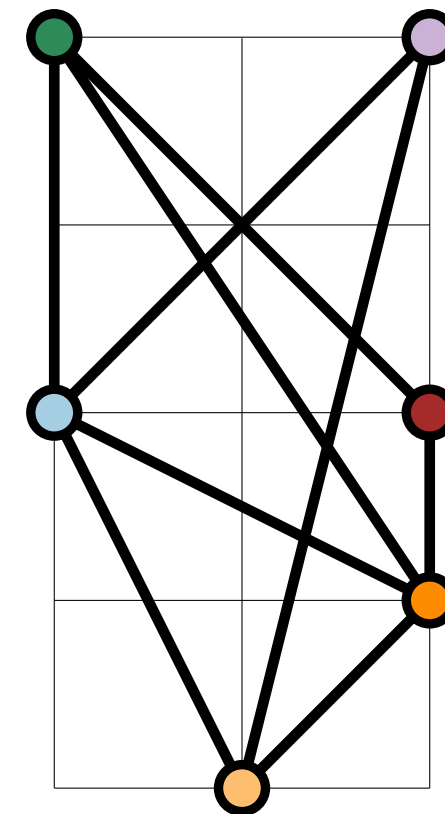
LIVE CHALLENGE

Compute k -planar drawings

- input: a graph G
- output: k -planar straight-line drawing of G
- objective: minimize k



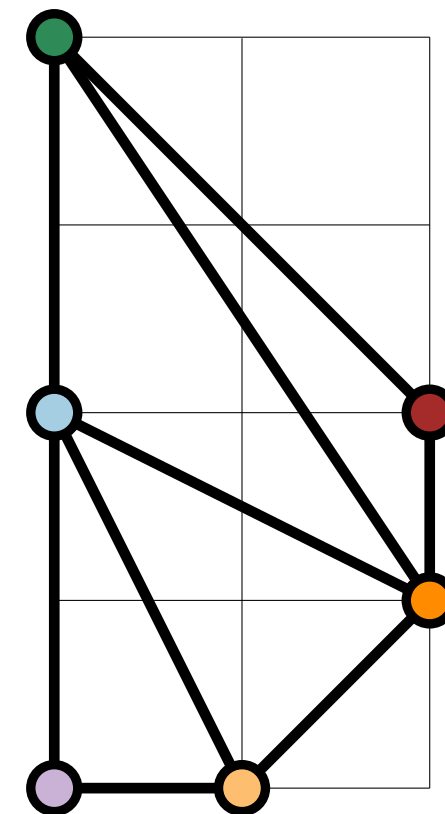
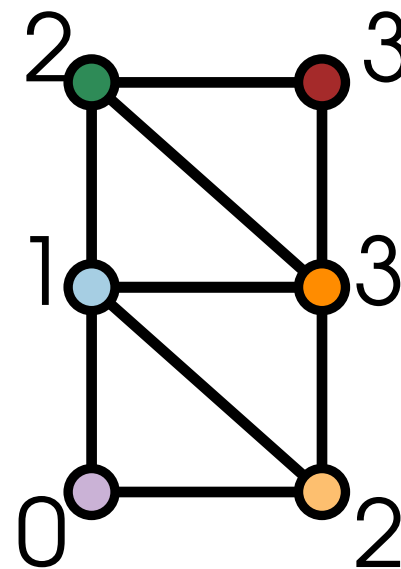
3-planar



LIVE CHALLENGE

Compute k -planar drawings

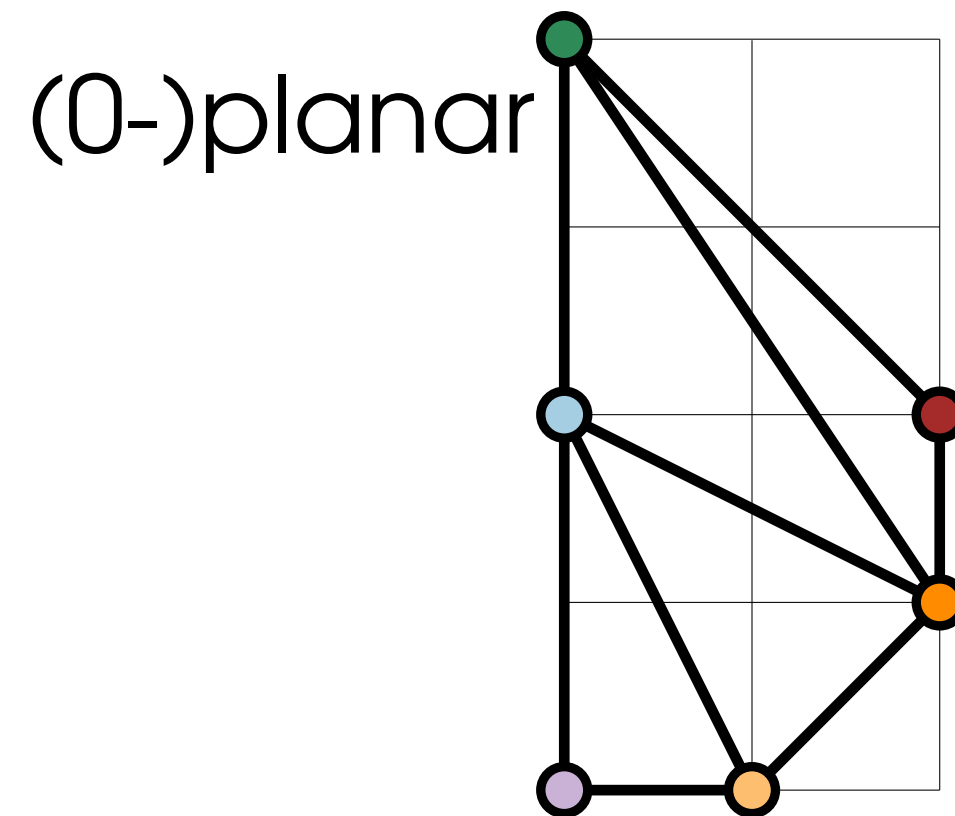
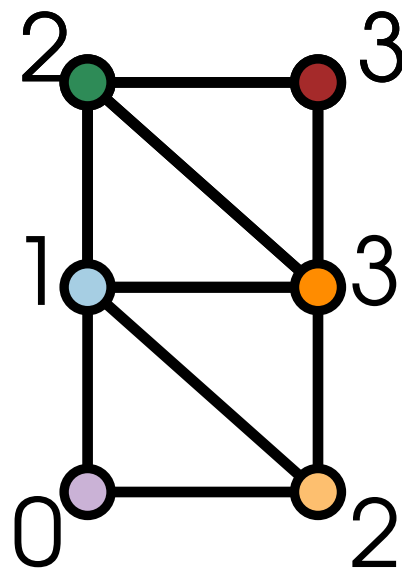
- input: a graph G
- output: k -planar straight-line drawing of G
- objective: minimize k



LIVE CHALLENGE

Compute k -planar drawings

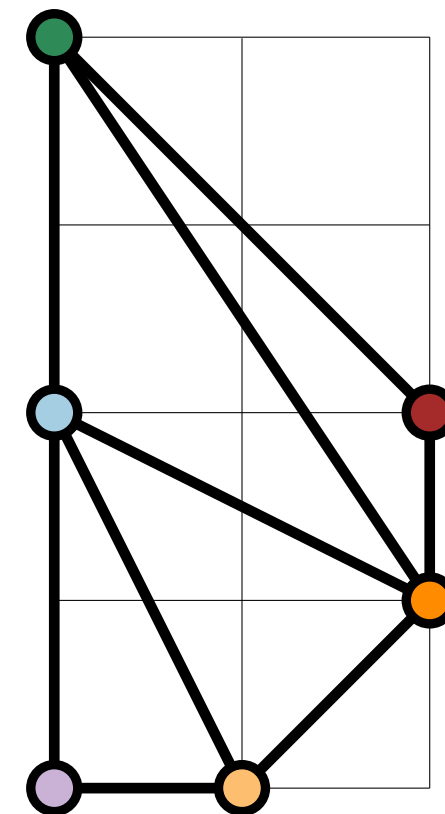
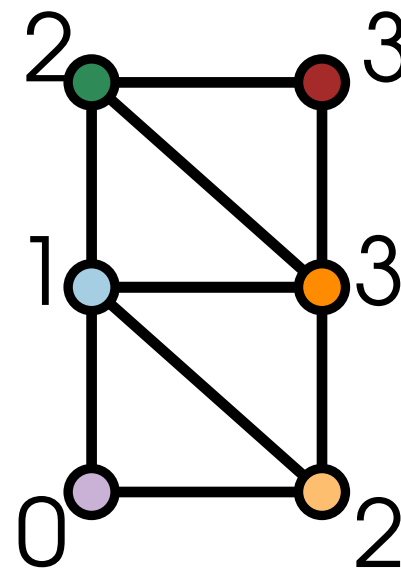
- input: a graph G
- output: k -planar straight-line drawing of G
- objective: minimize k



LIVE CHALLENGE

Compute k -planar drawings

- input: a graph G
- output: k -planar straight-line drawing of G
- objective: minimize k
- vertices must be on integer grid



LIVE CHALLENGE

Photos



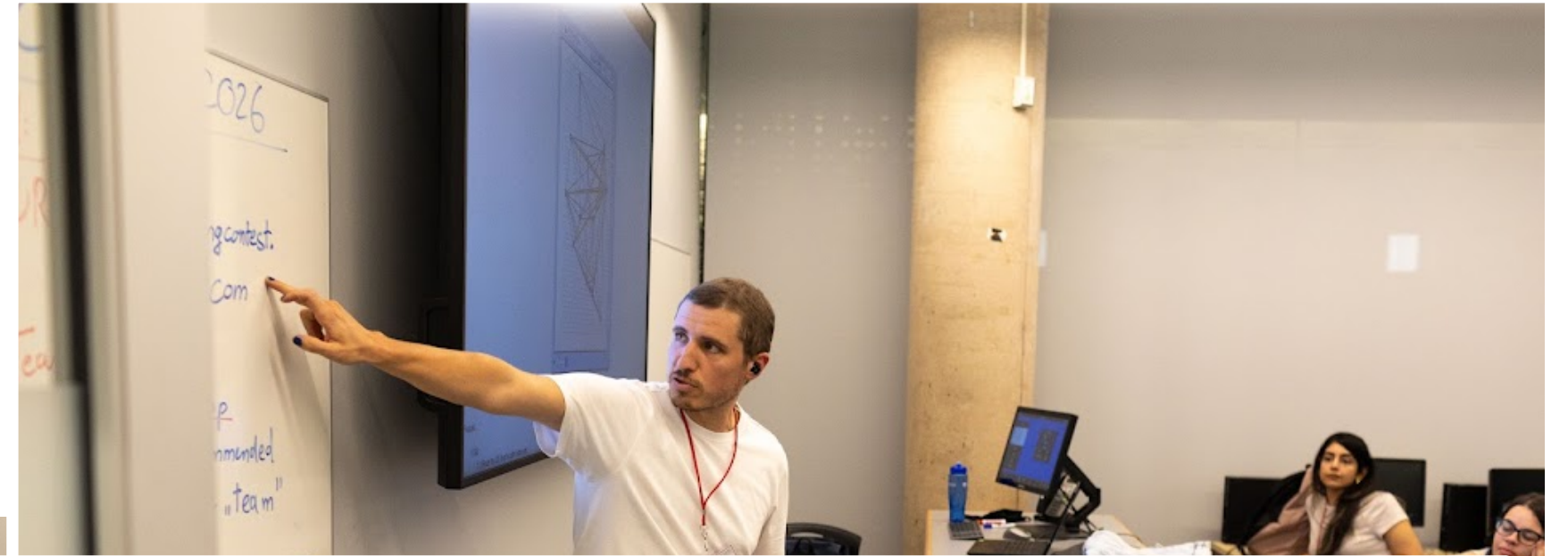
LIVE CHALLENGE

Photos



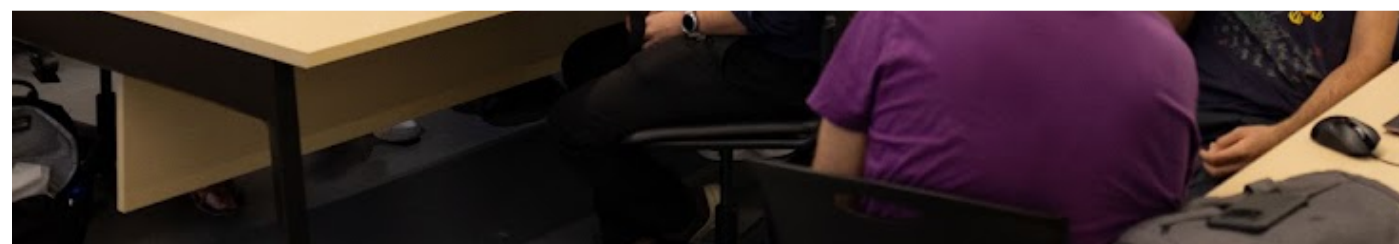
LIVE CHALLENGE

Photos



LIVE CHALLENGE

Photos



LIVE CHALLENGE

Photos



LIVE CHALLENGE

Photos



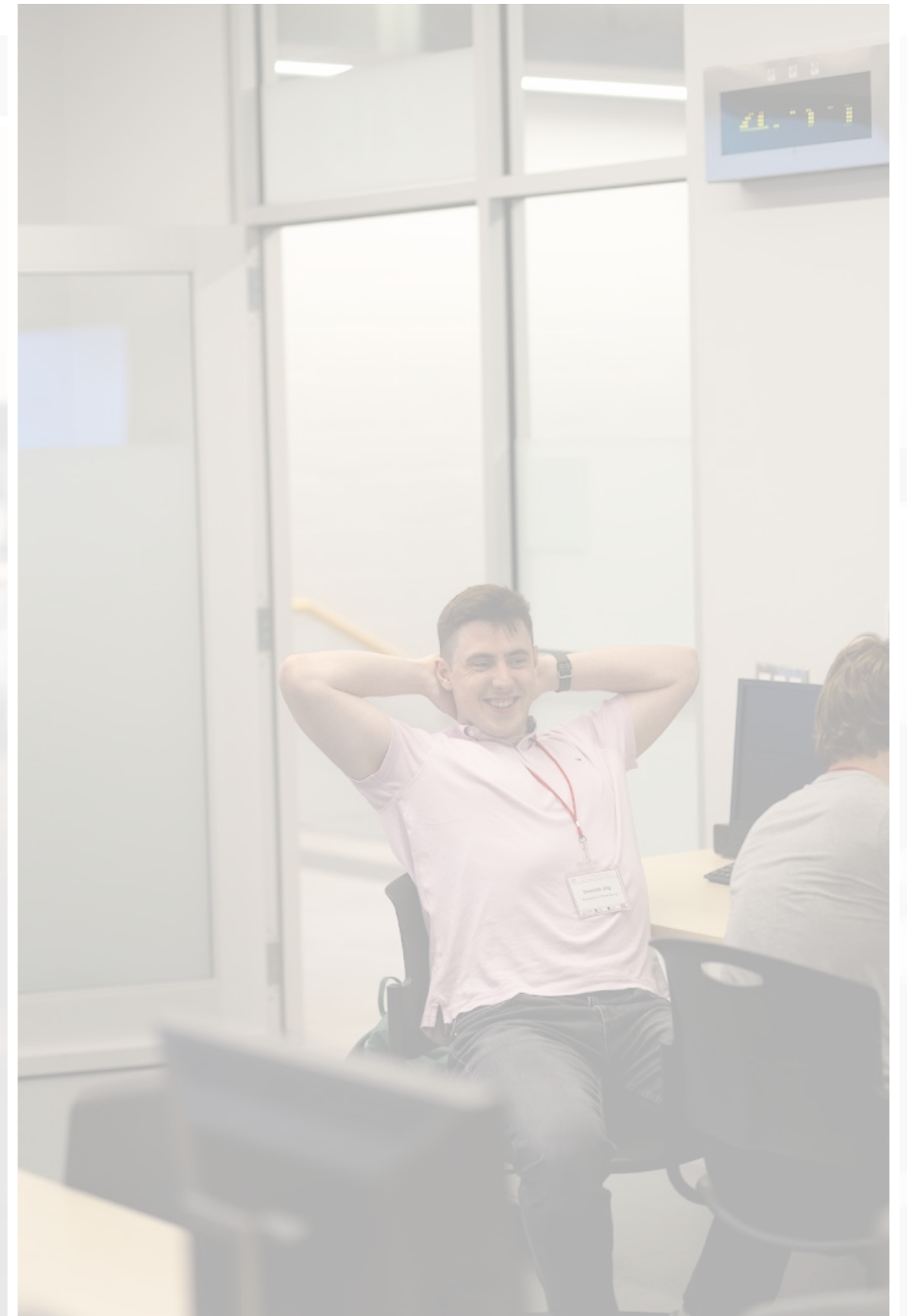
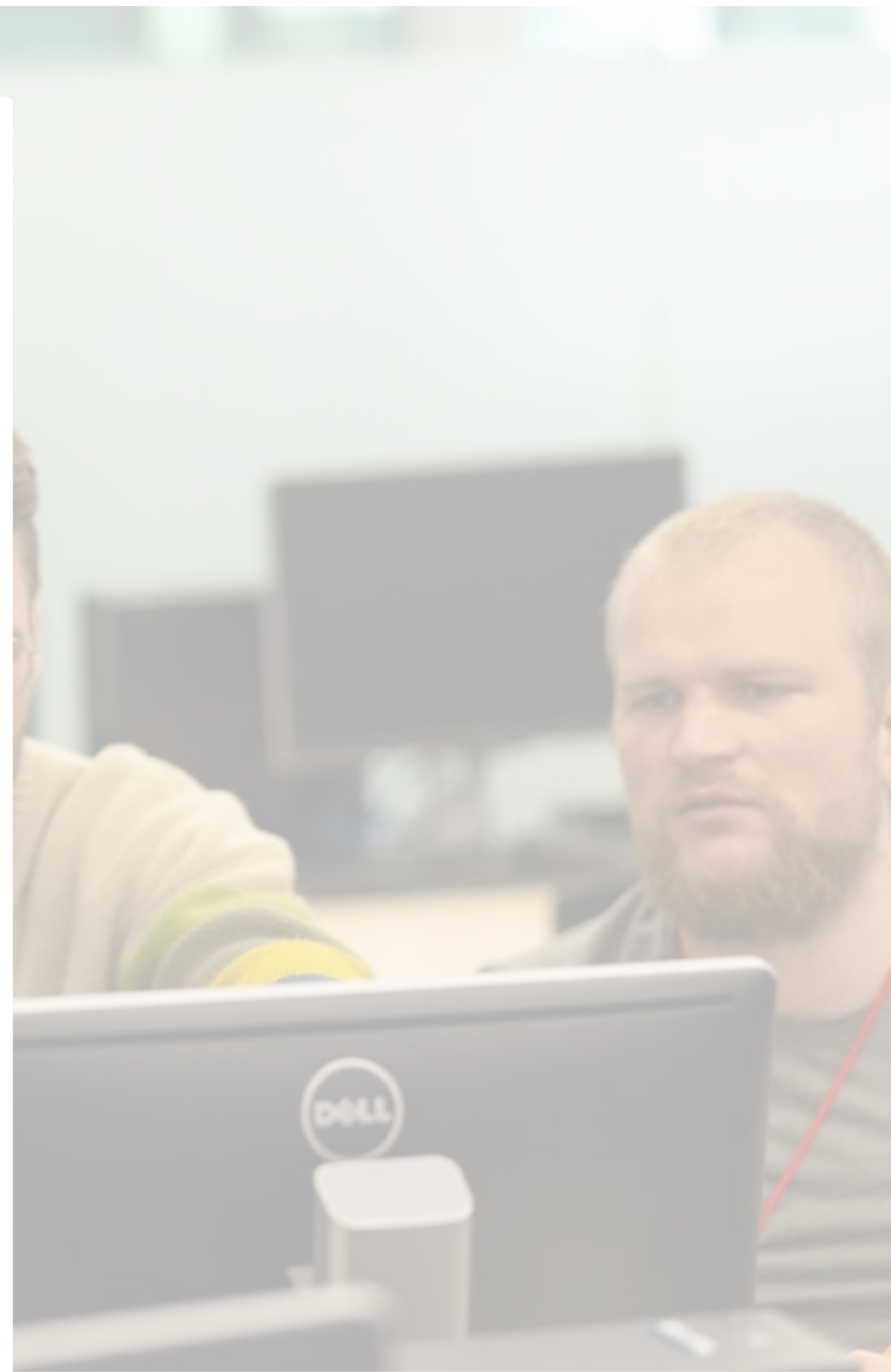
LIVE CHALLENGE

Photos



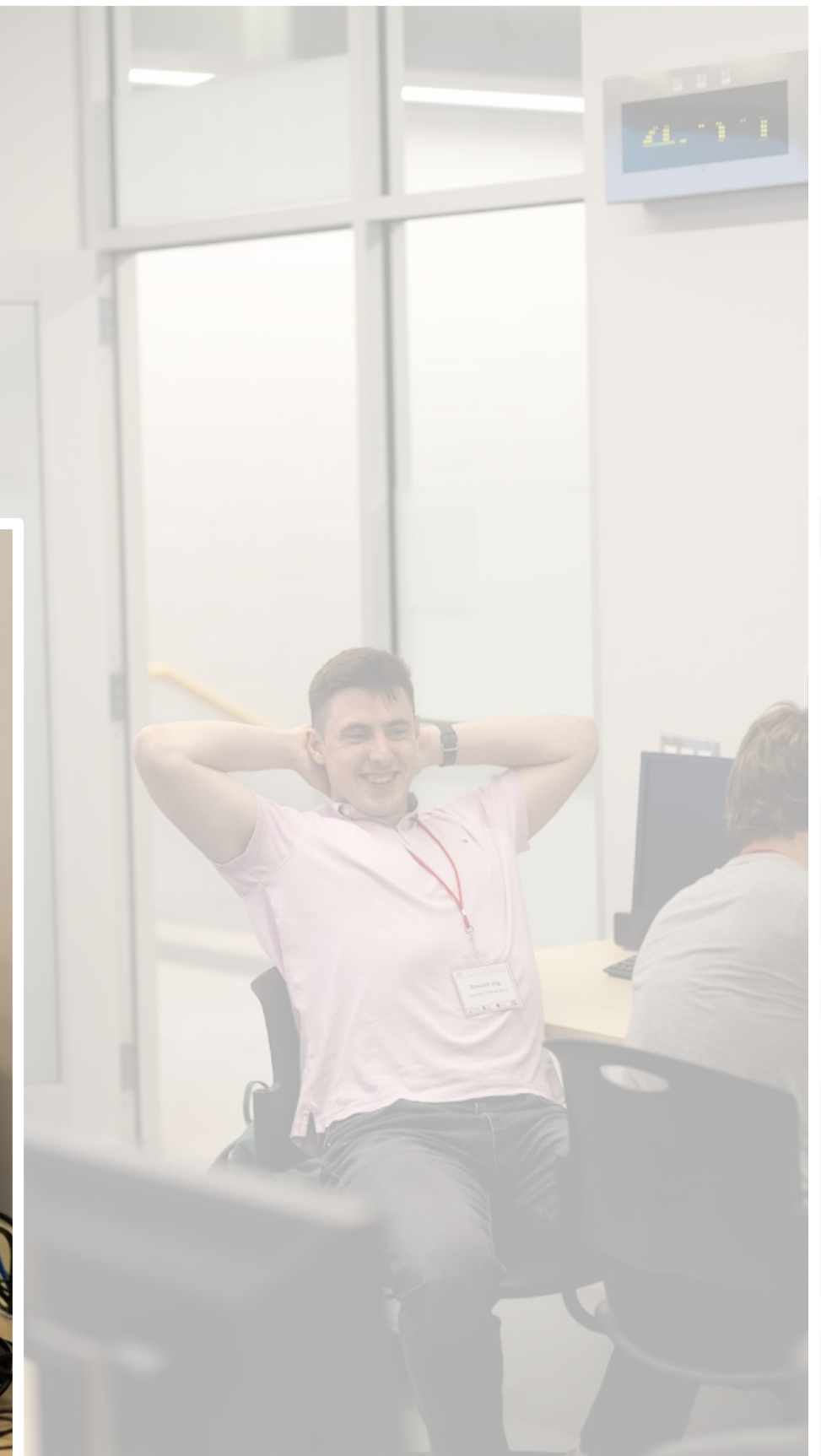
LIVE CHALLENGE

Photos



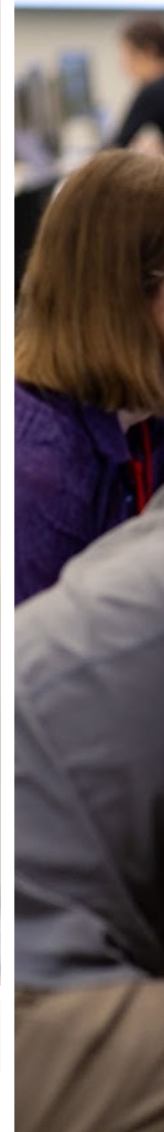
LIVE CHALLENGE

Photos



LIVE CHALLENGE

Photos



LIVE CHALLENGE

Photos



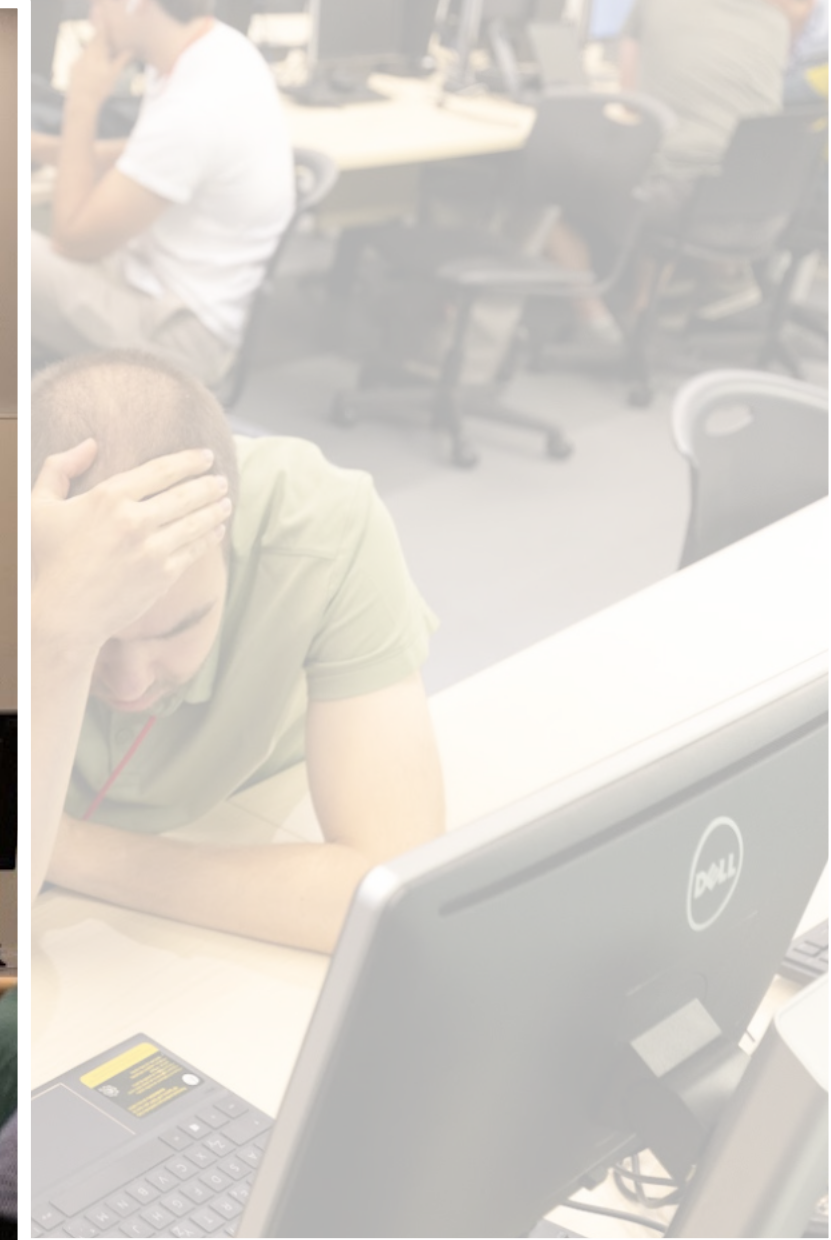
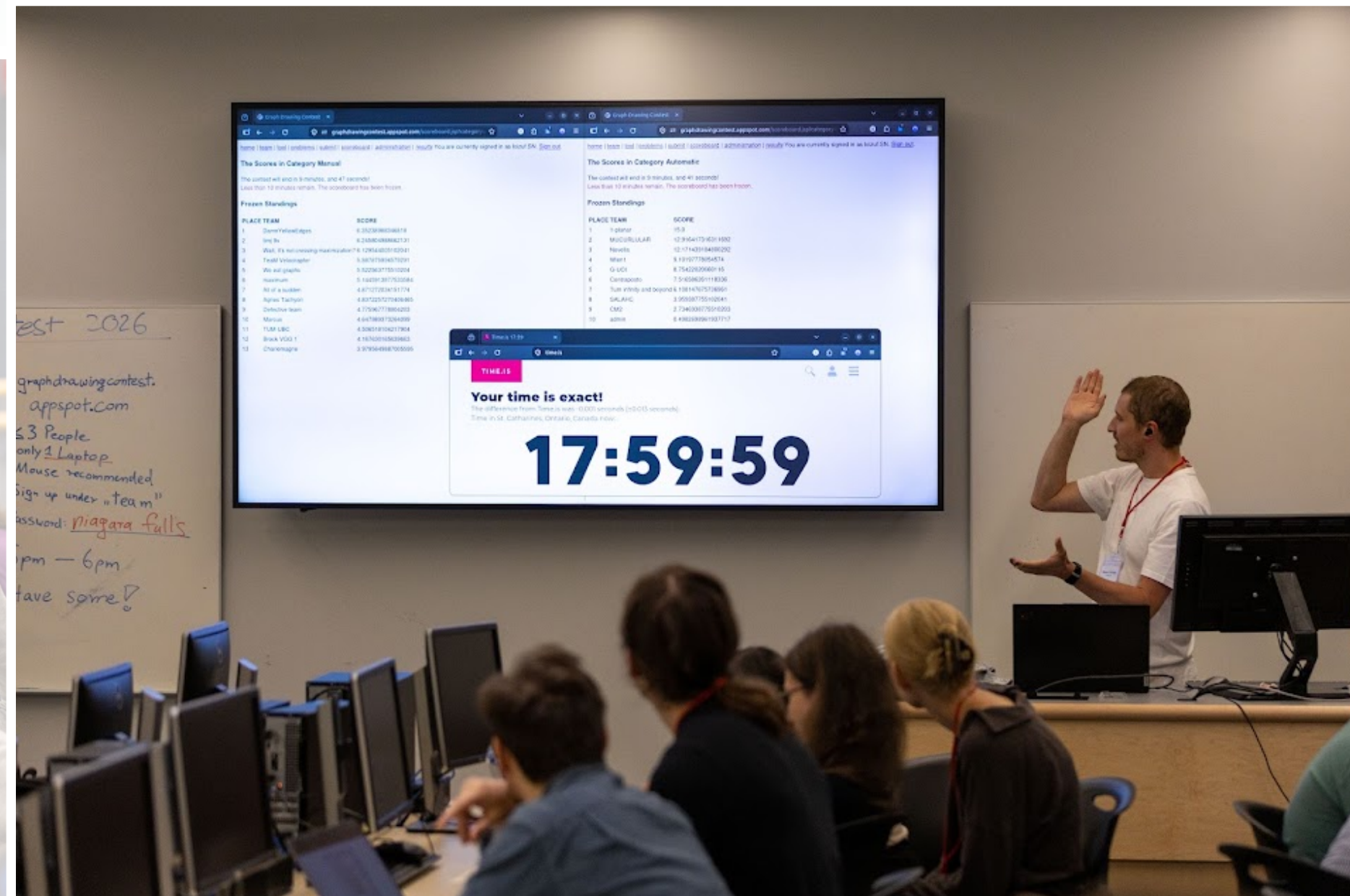
LIVE CHALLENGE

Photos



LIVE CHALLENGE

Photos

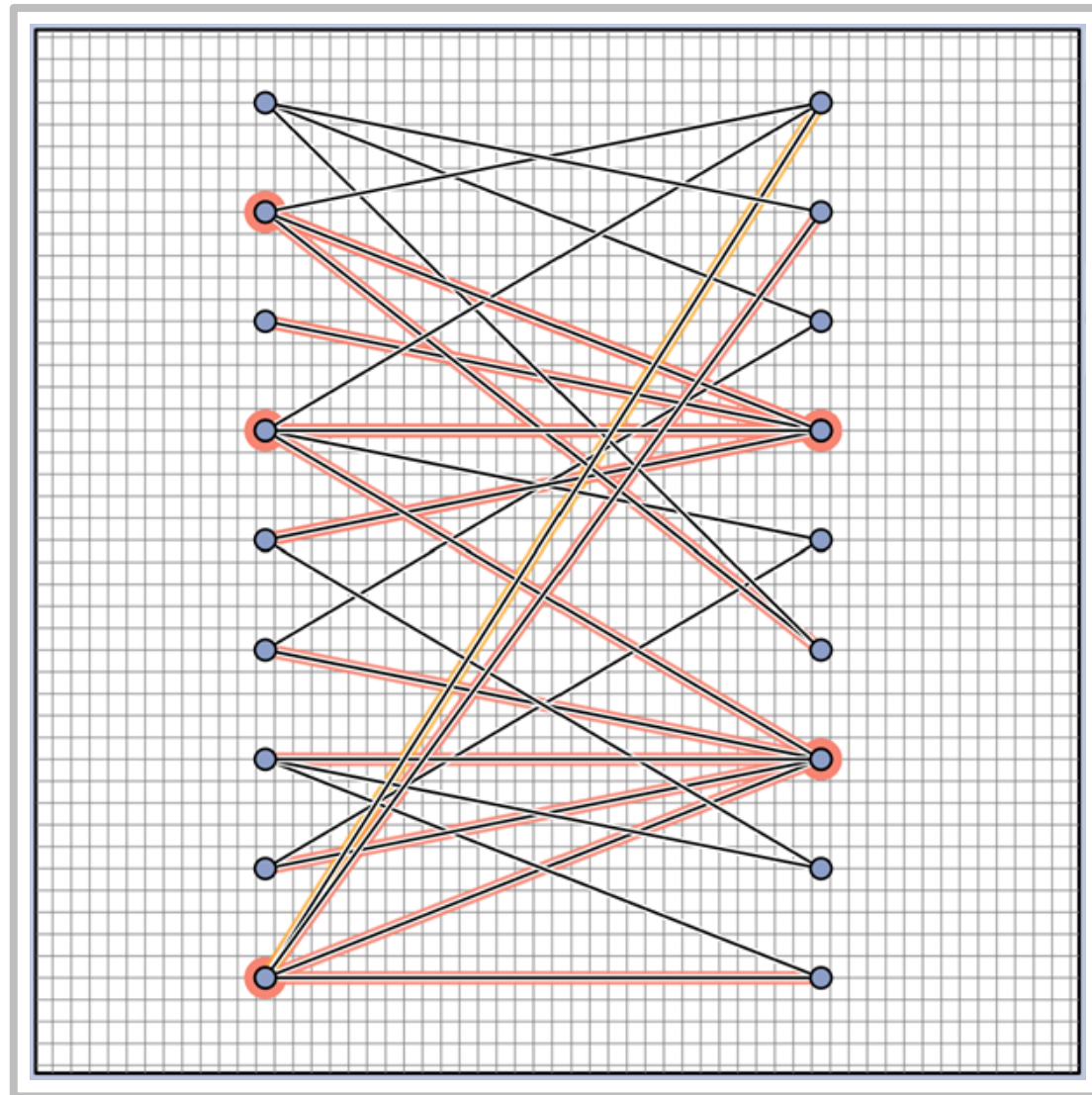


LIVE CHALLENGE

Manual category graphs

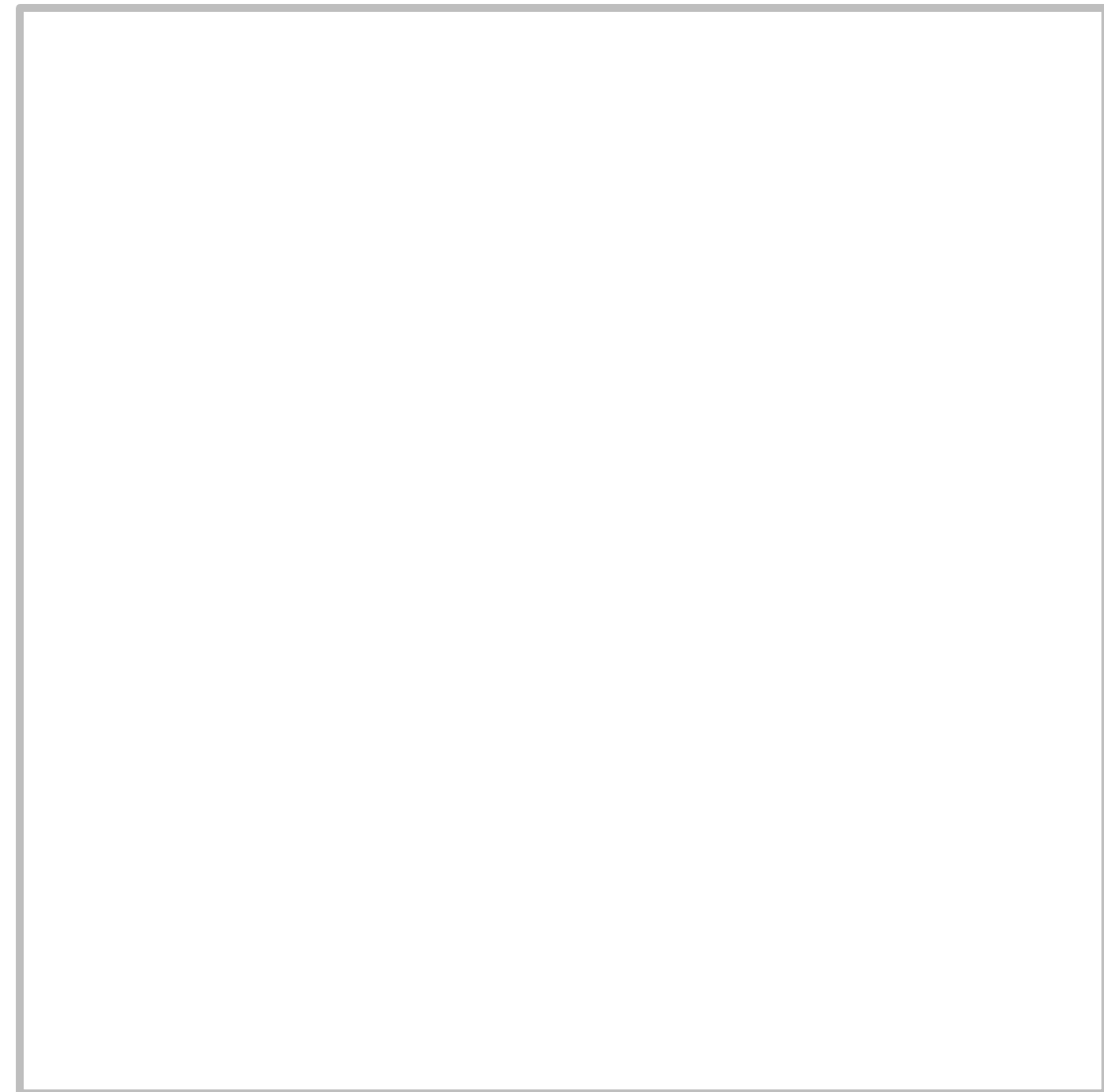
LIVE CHALLENGE

Manual category graphs



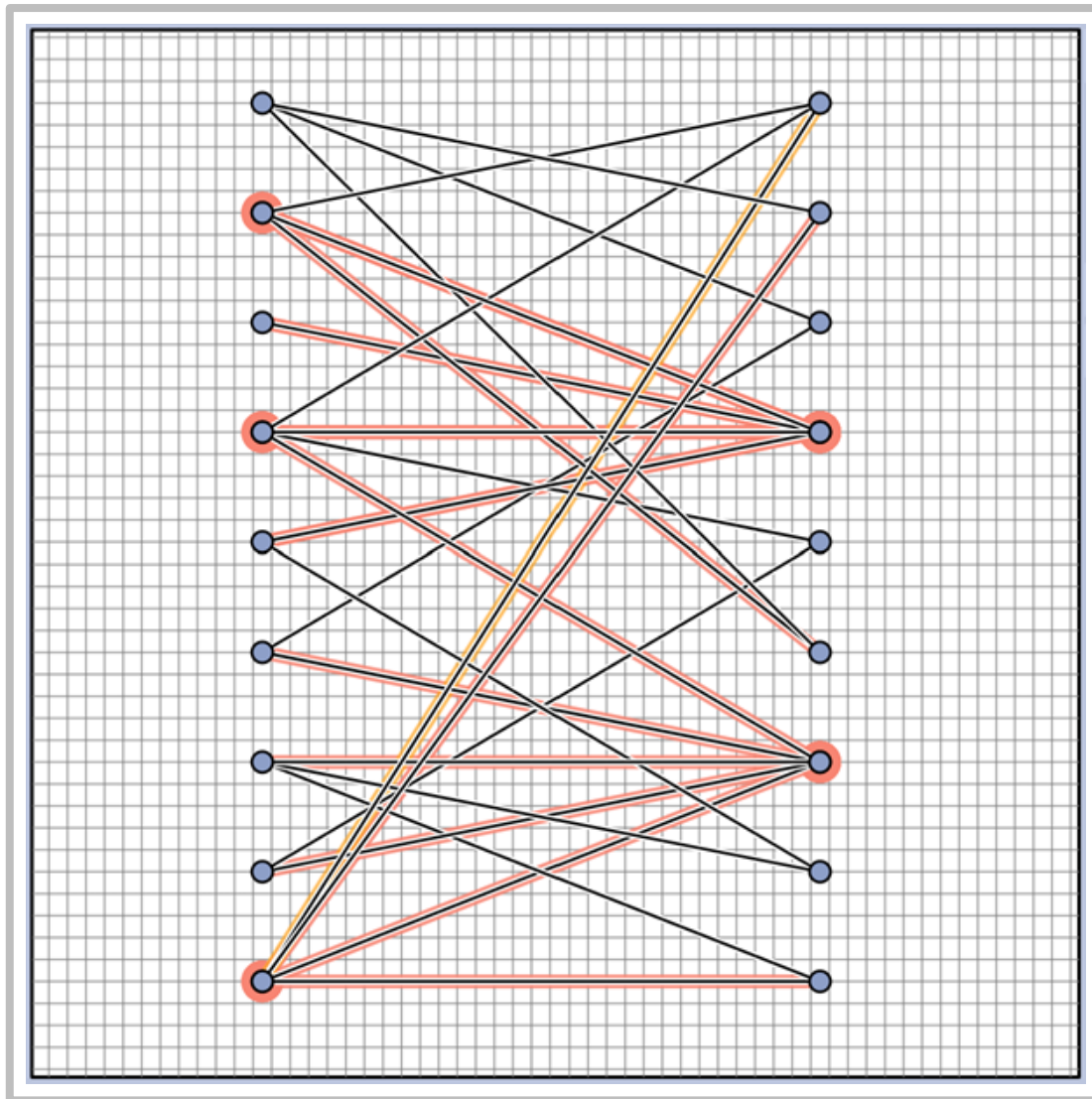
input

graph 1



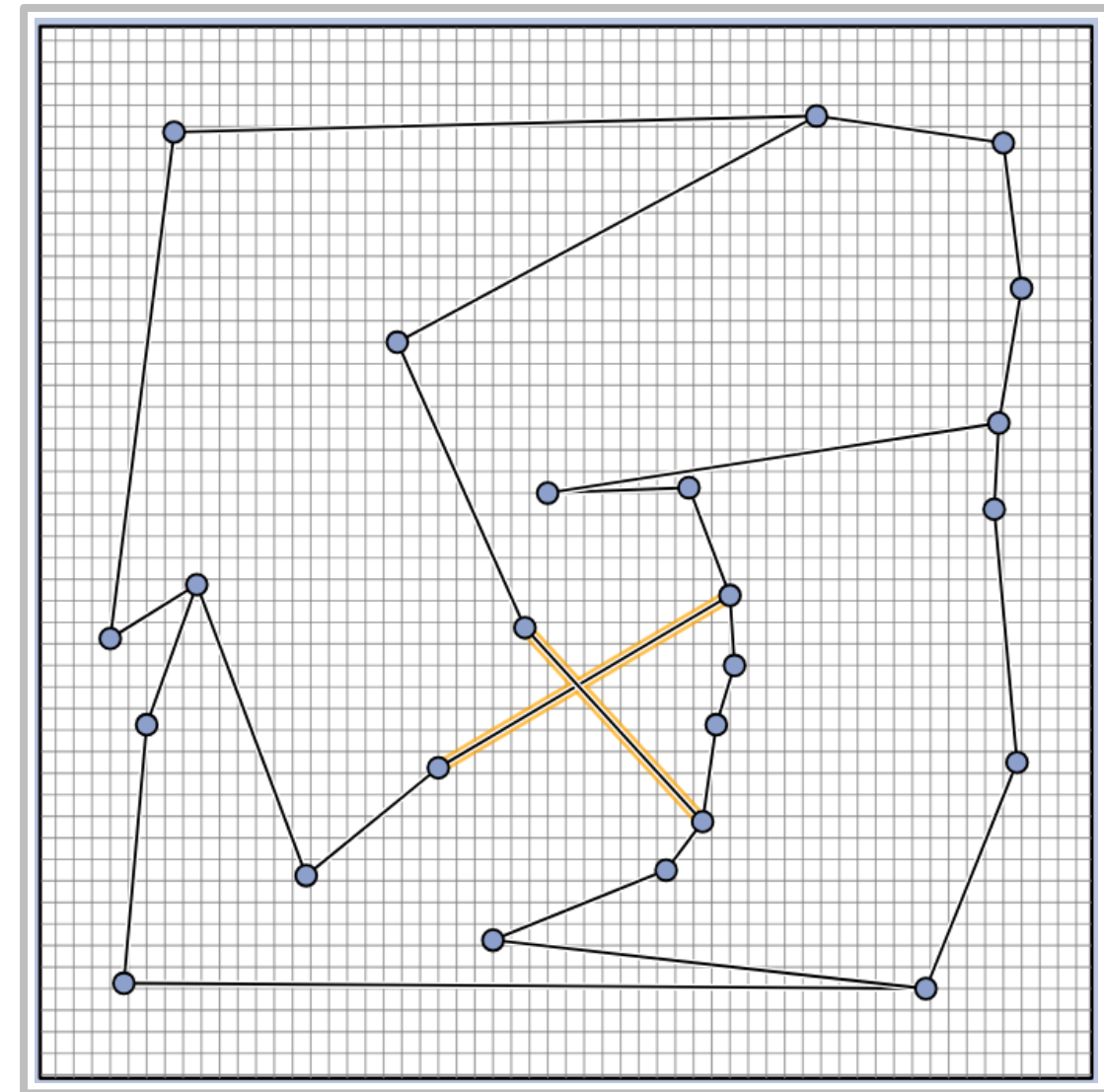
LIVE CHALLENGE

Manual category graphs



input

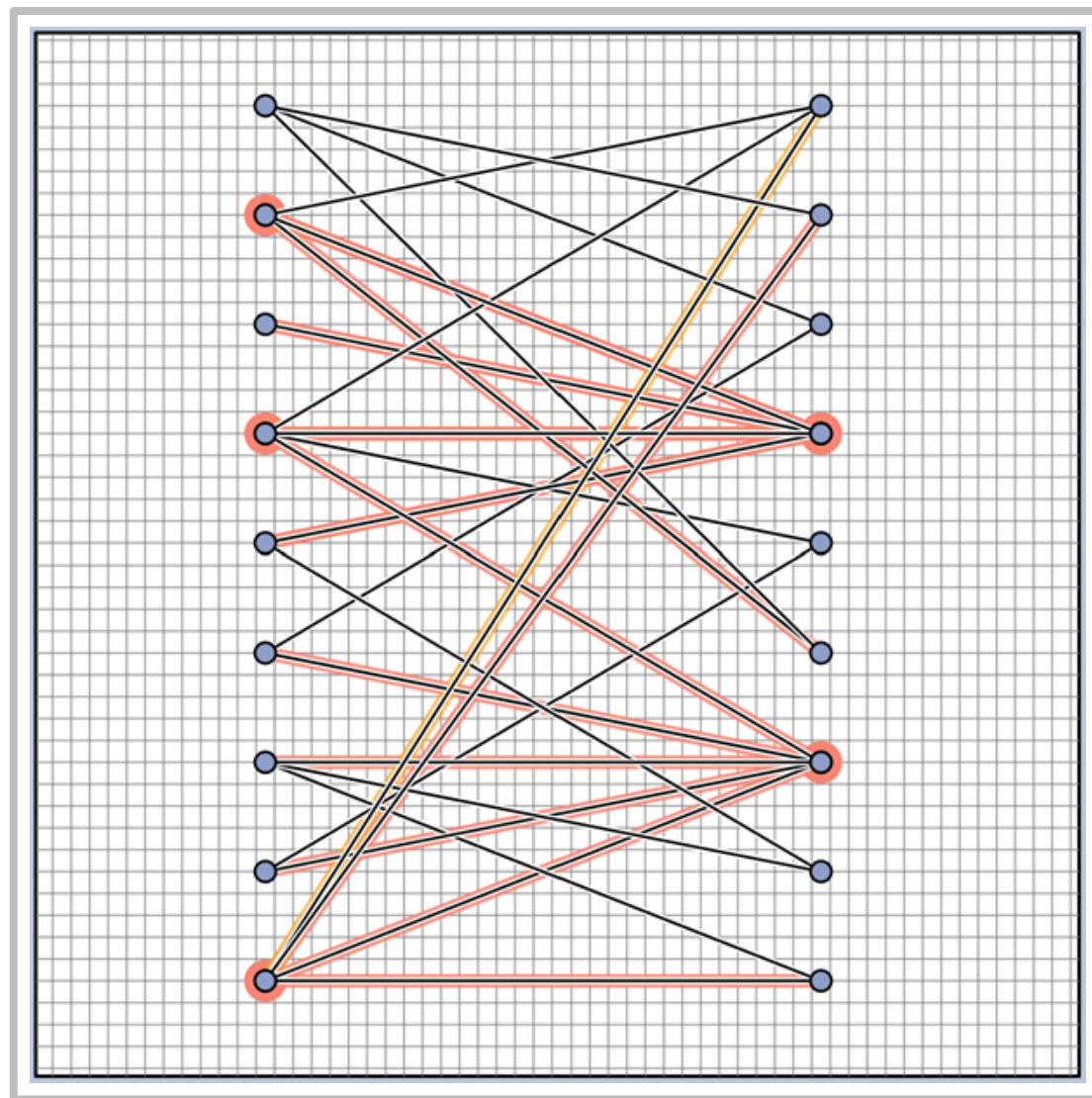
graph 1



best manual
TUM-UBC
1-planar

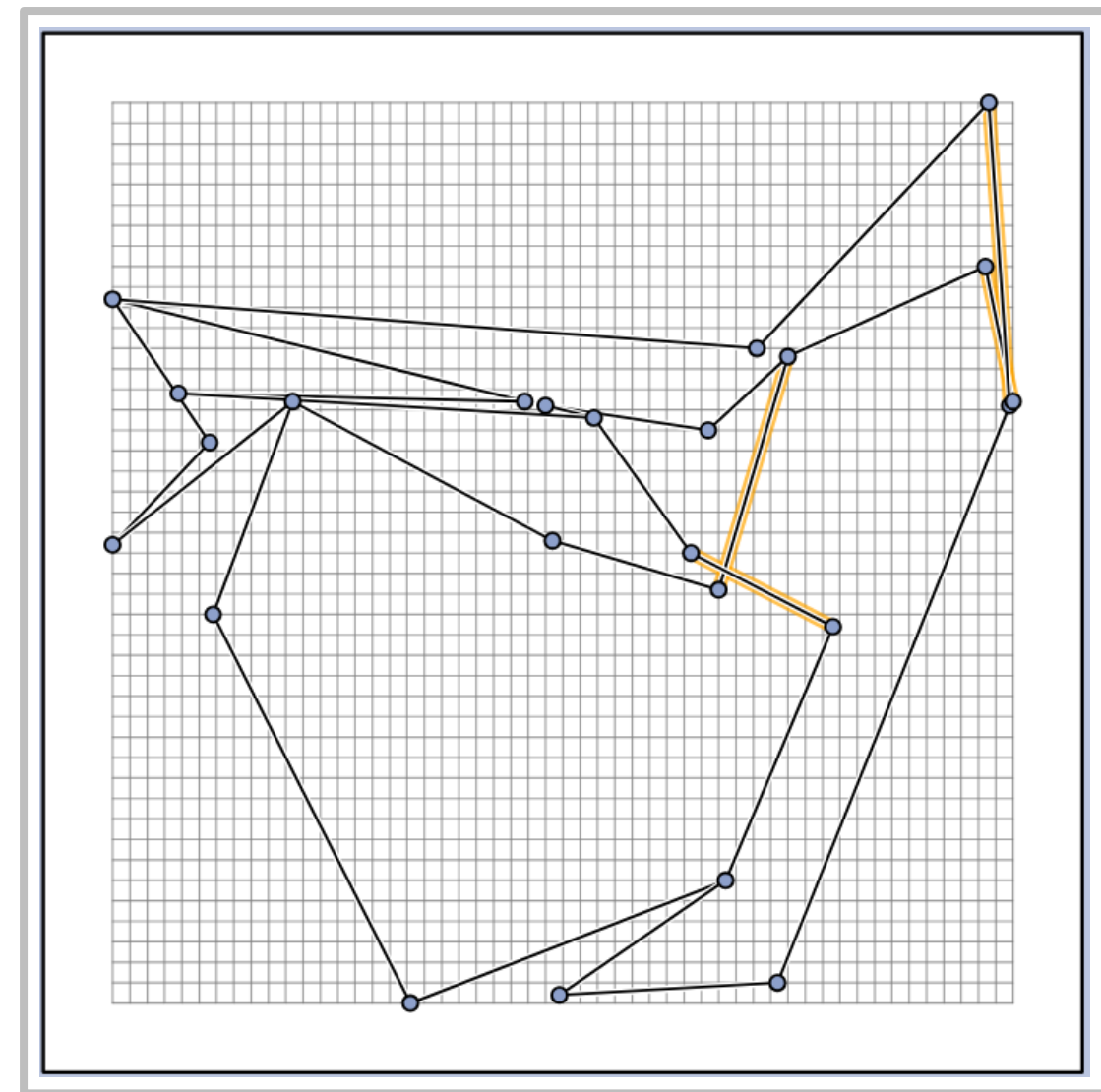
LIVE CHALLENGE

Manual category graphs



input

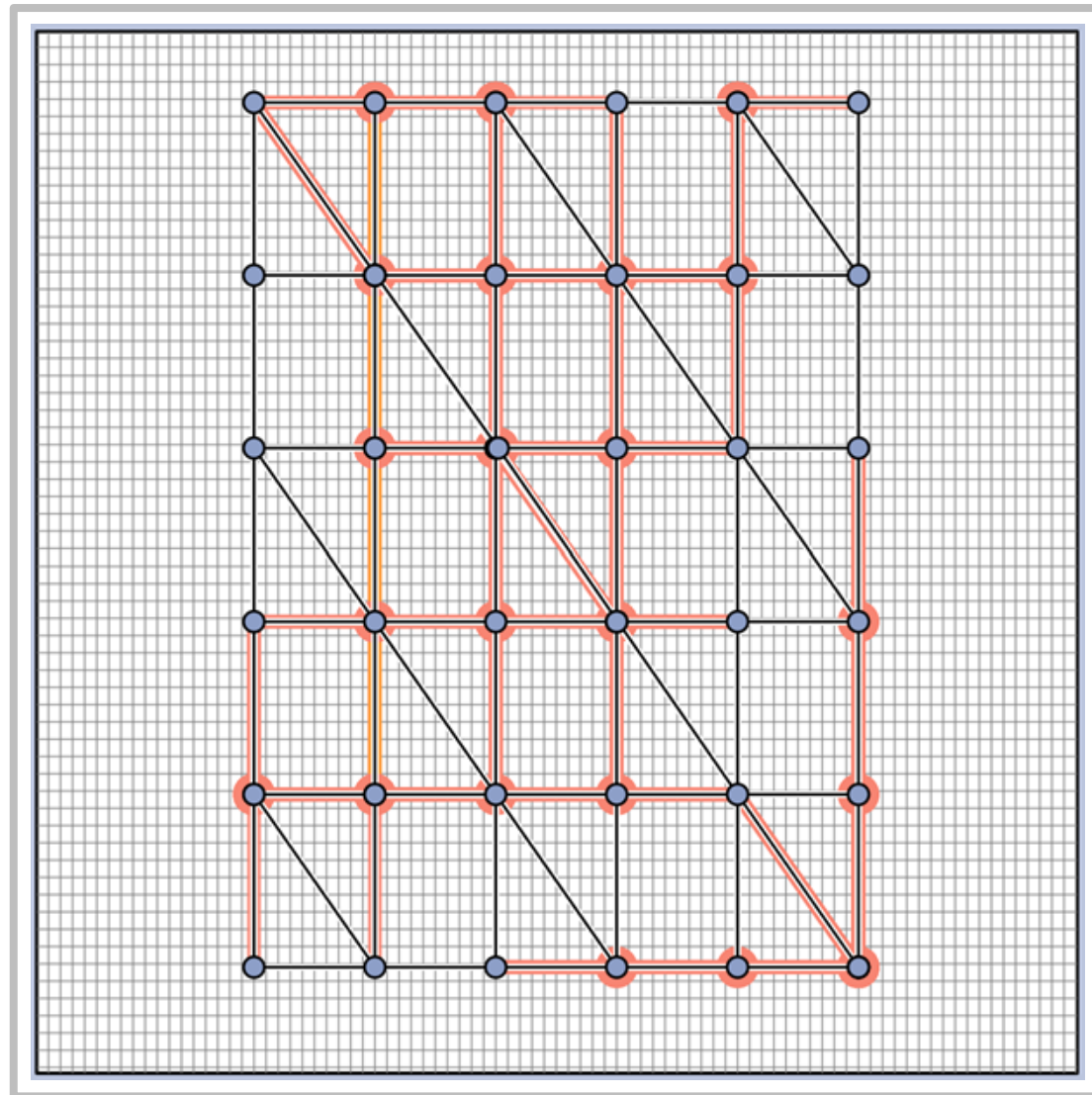
graph 1



best automatic
CM2
1-planar

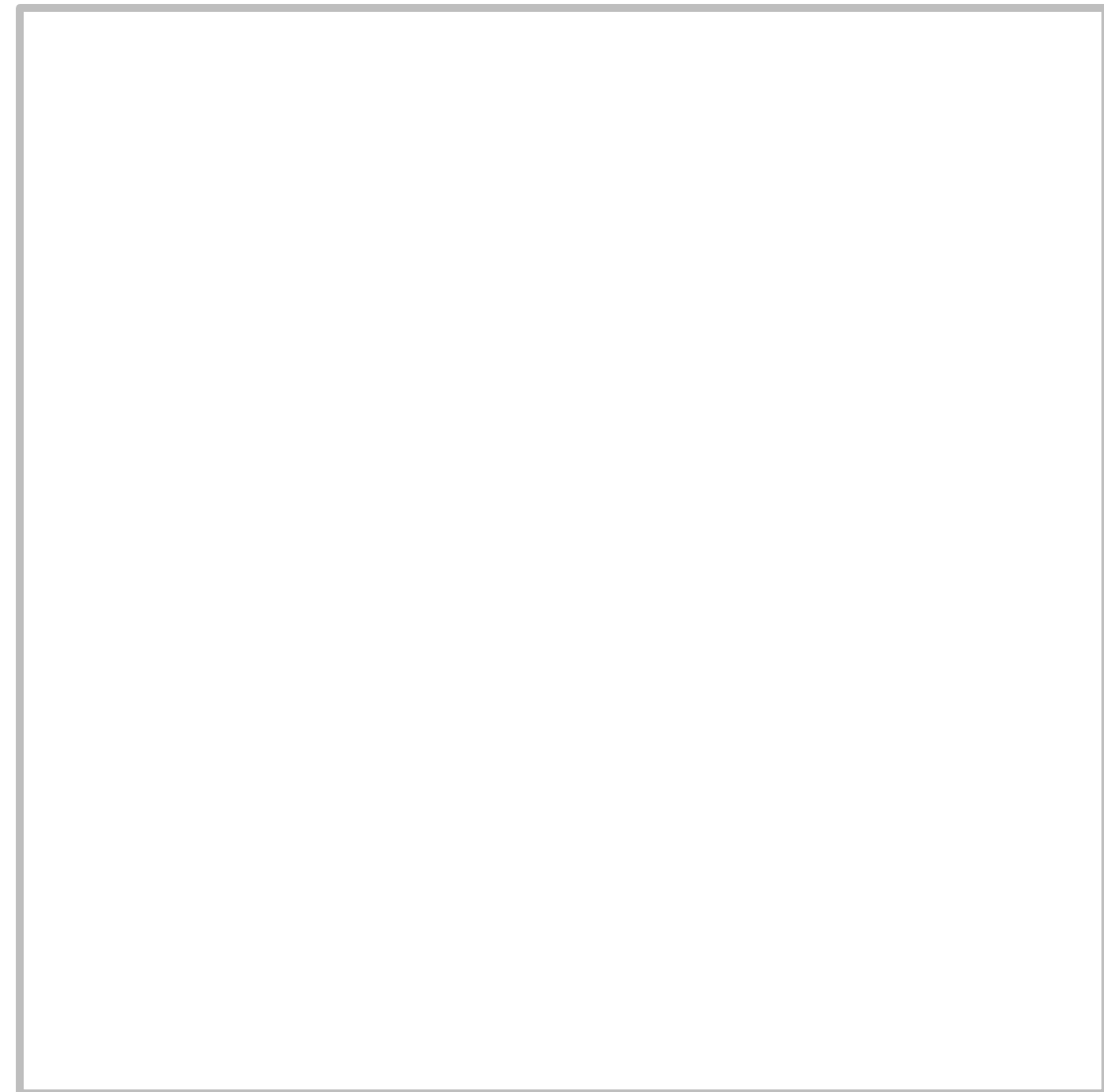
LIVE CHALLENGE

Manual category graphs



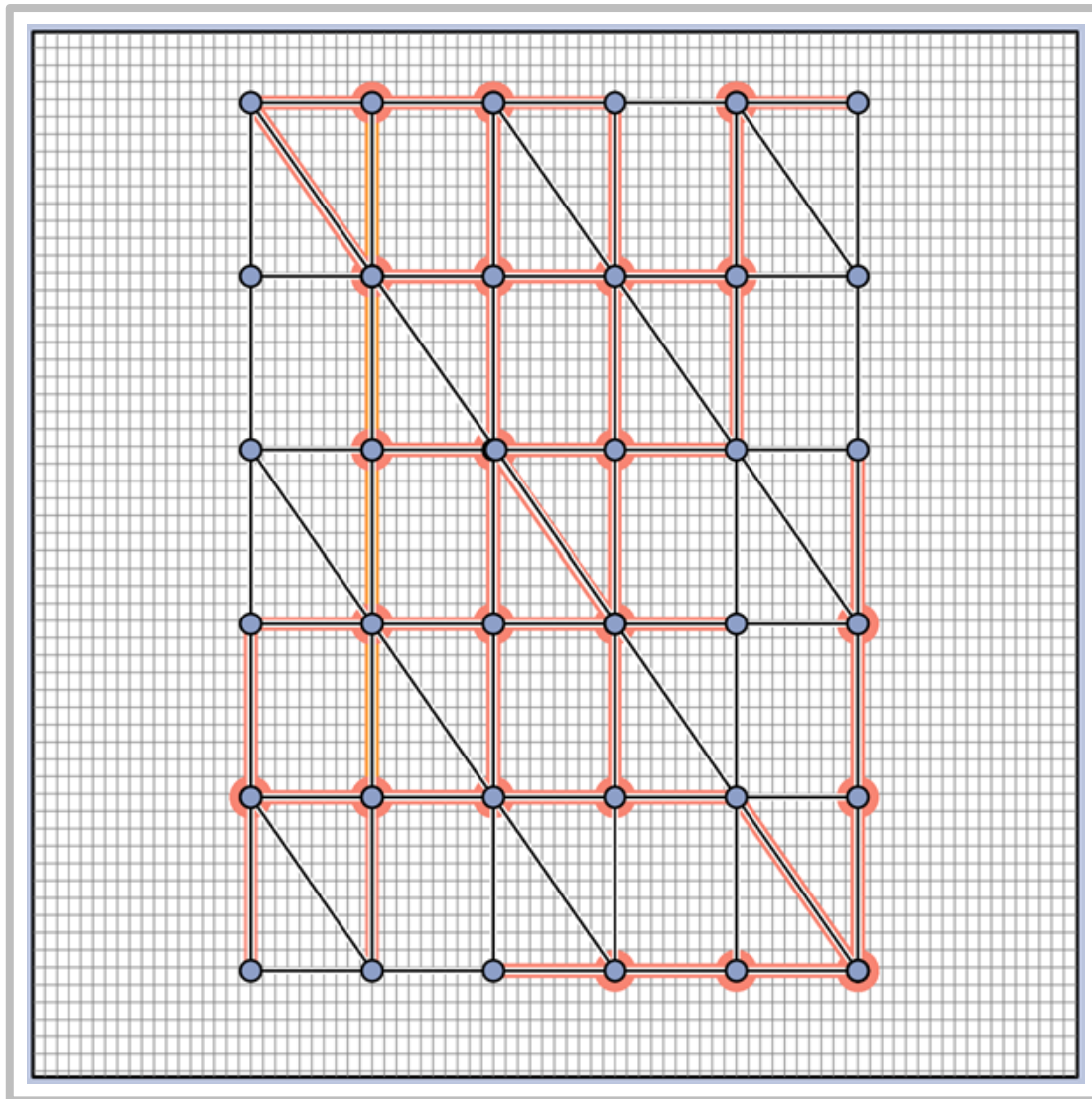
input

graph **2**



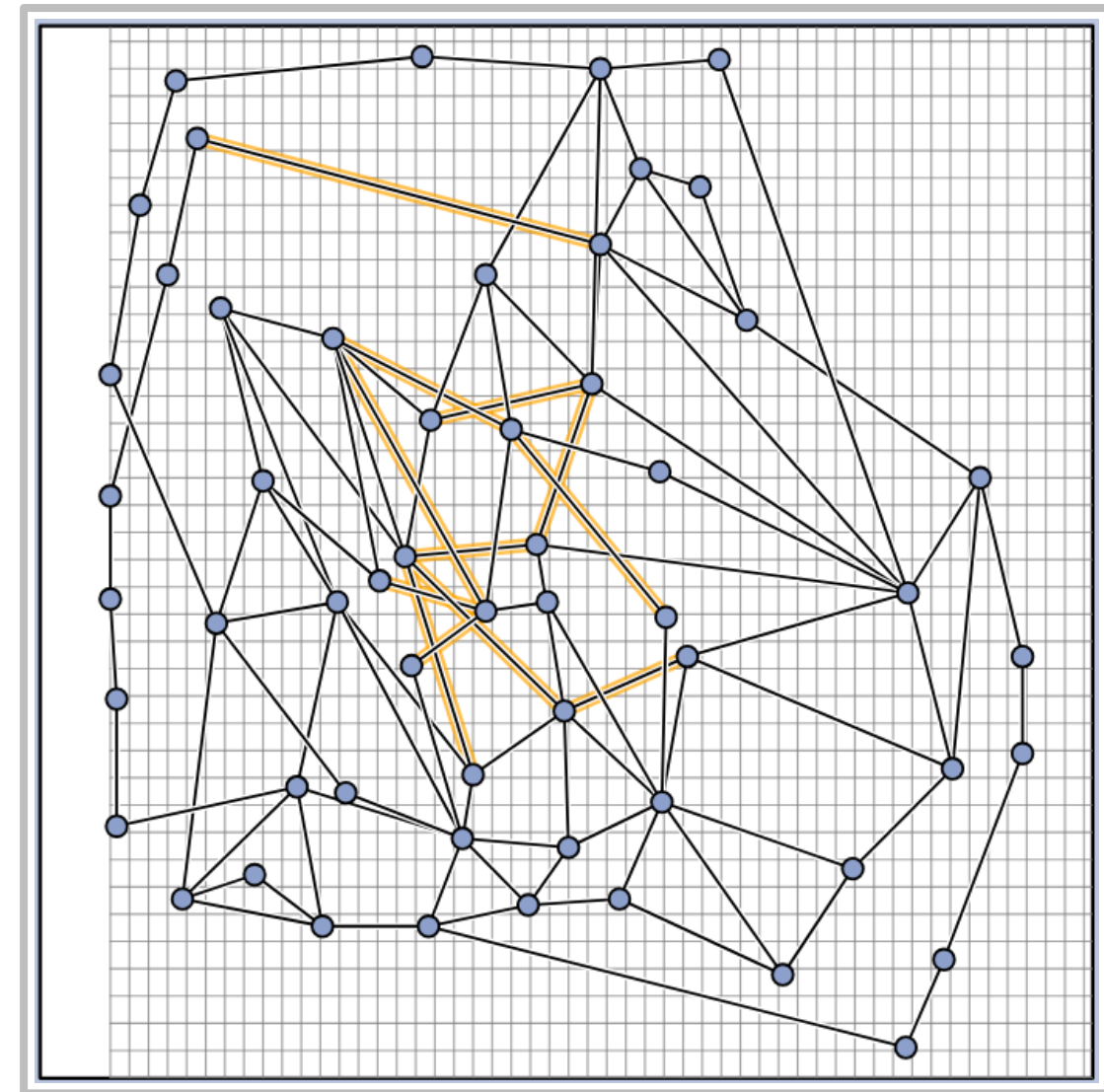
LIVE CHALLENGE

Manual category graphs



input

graph **2**

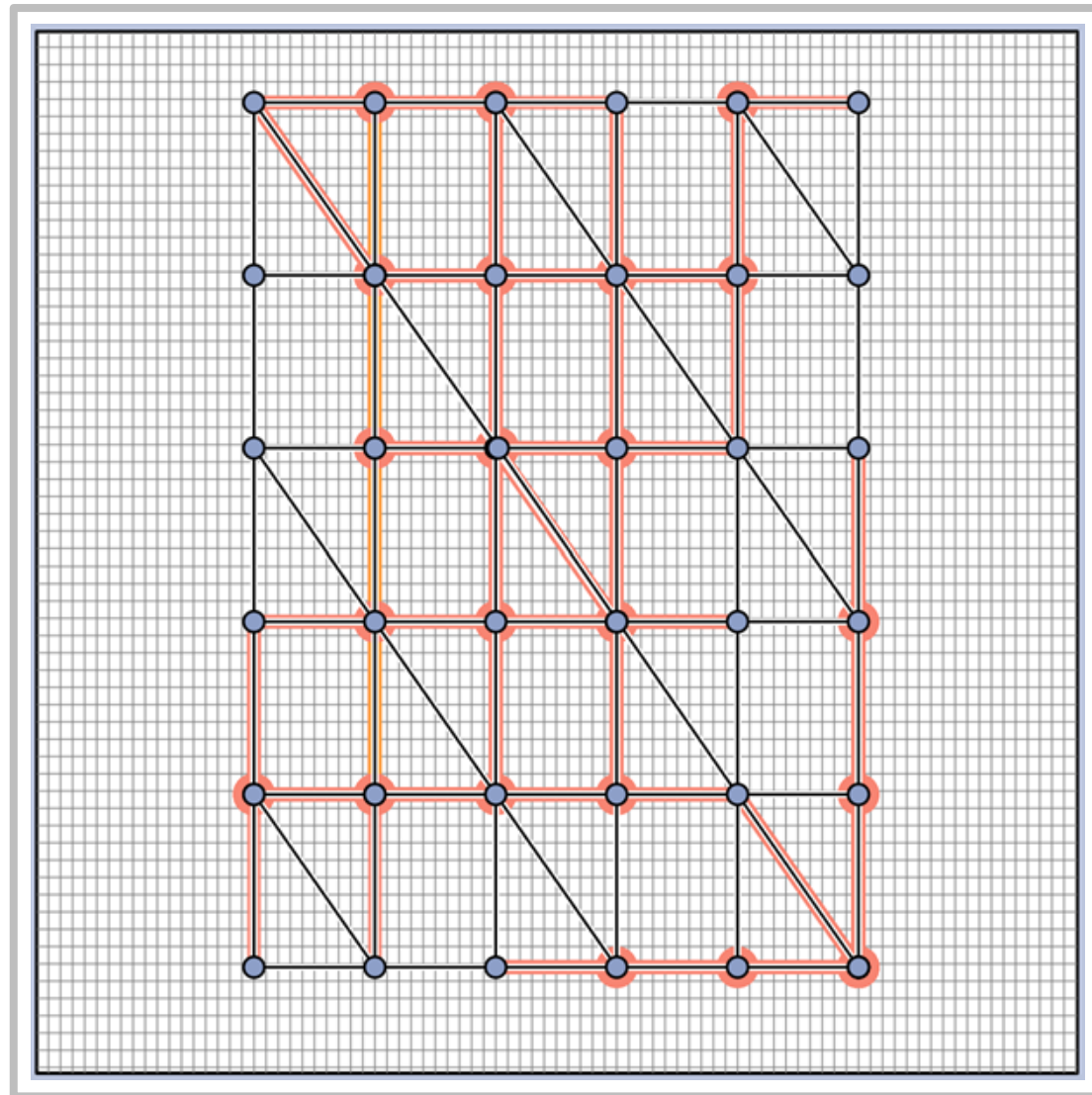


best manual
We eat graphs

2-planar

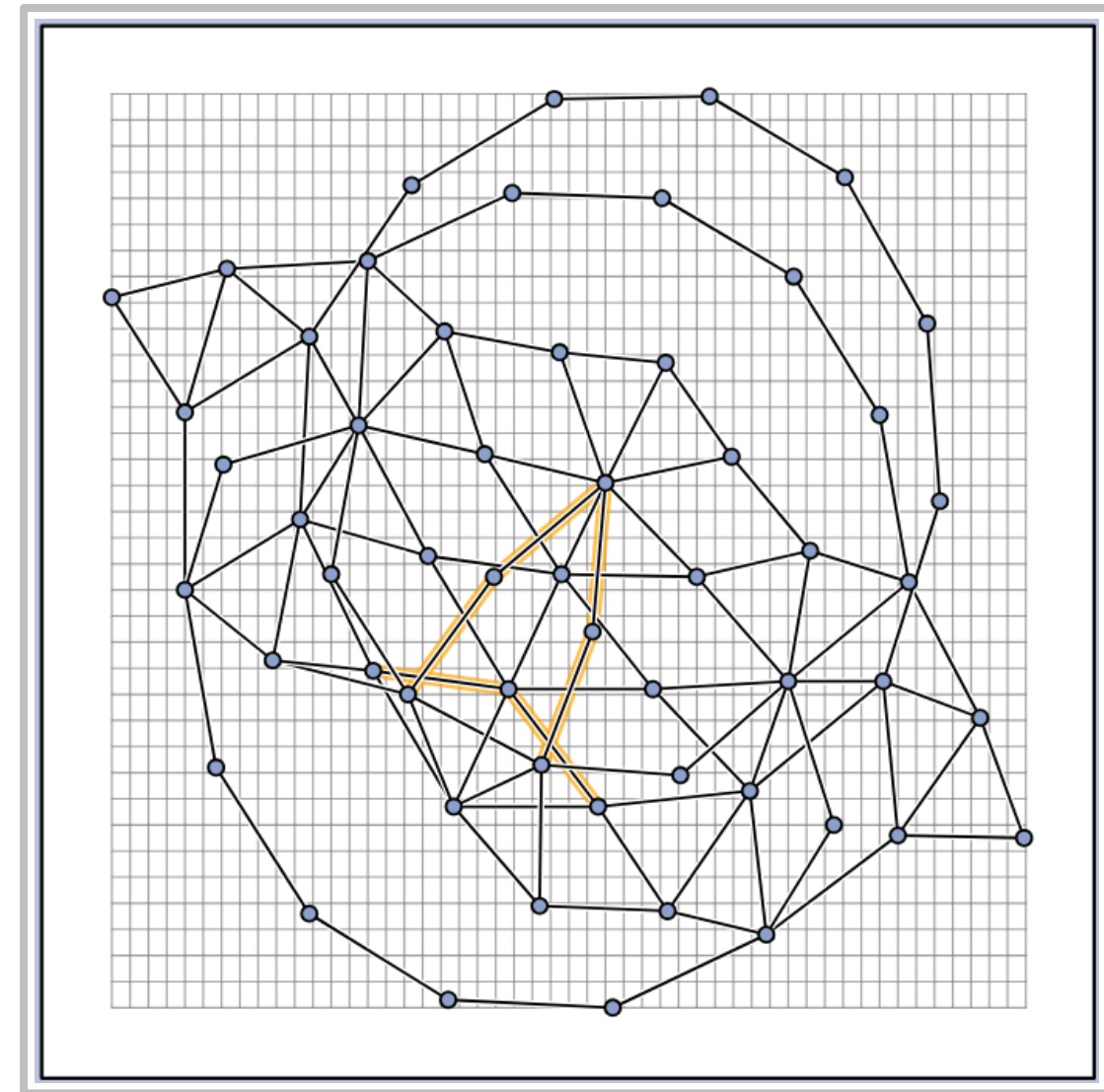
LIVE CHALLENGE

Manual category graphs



input

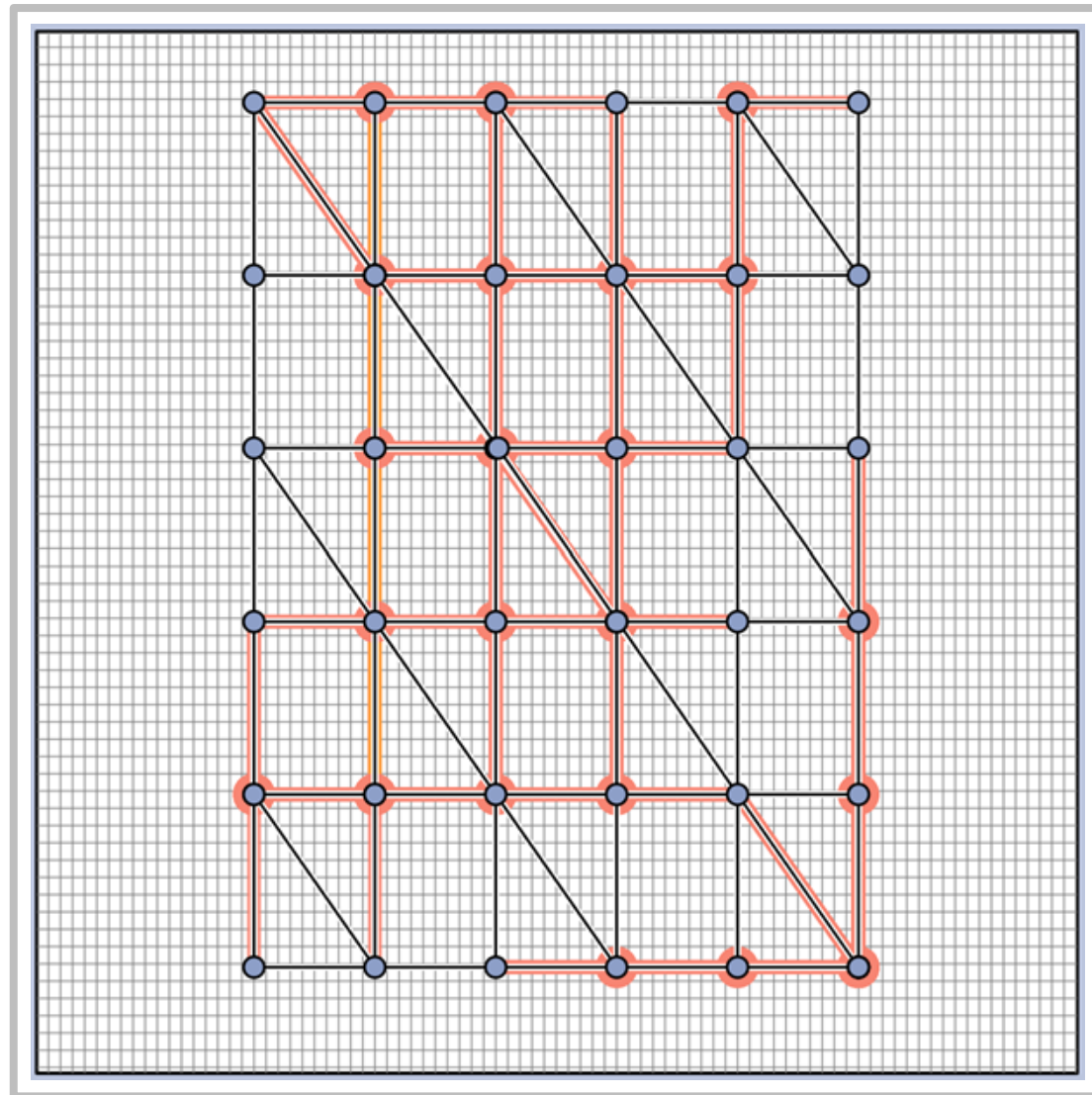
graph **2**



best automatic
Tum infinity and beyond
2-planar

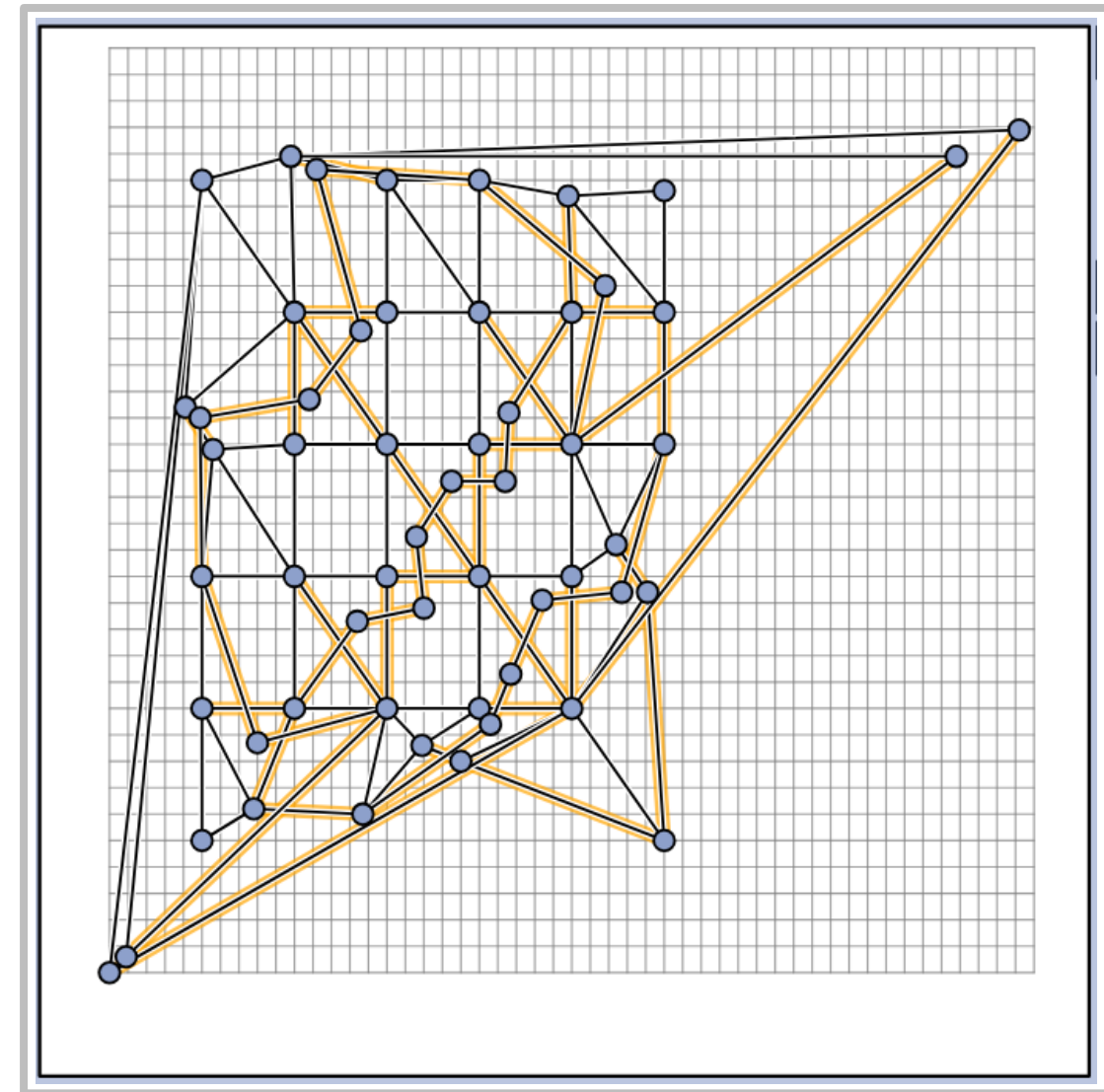
LIVE CHALLENGE

Manual category graphs



input

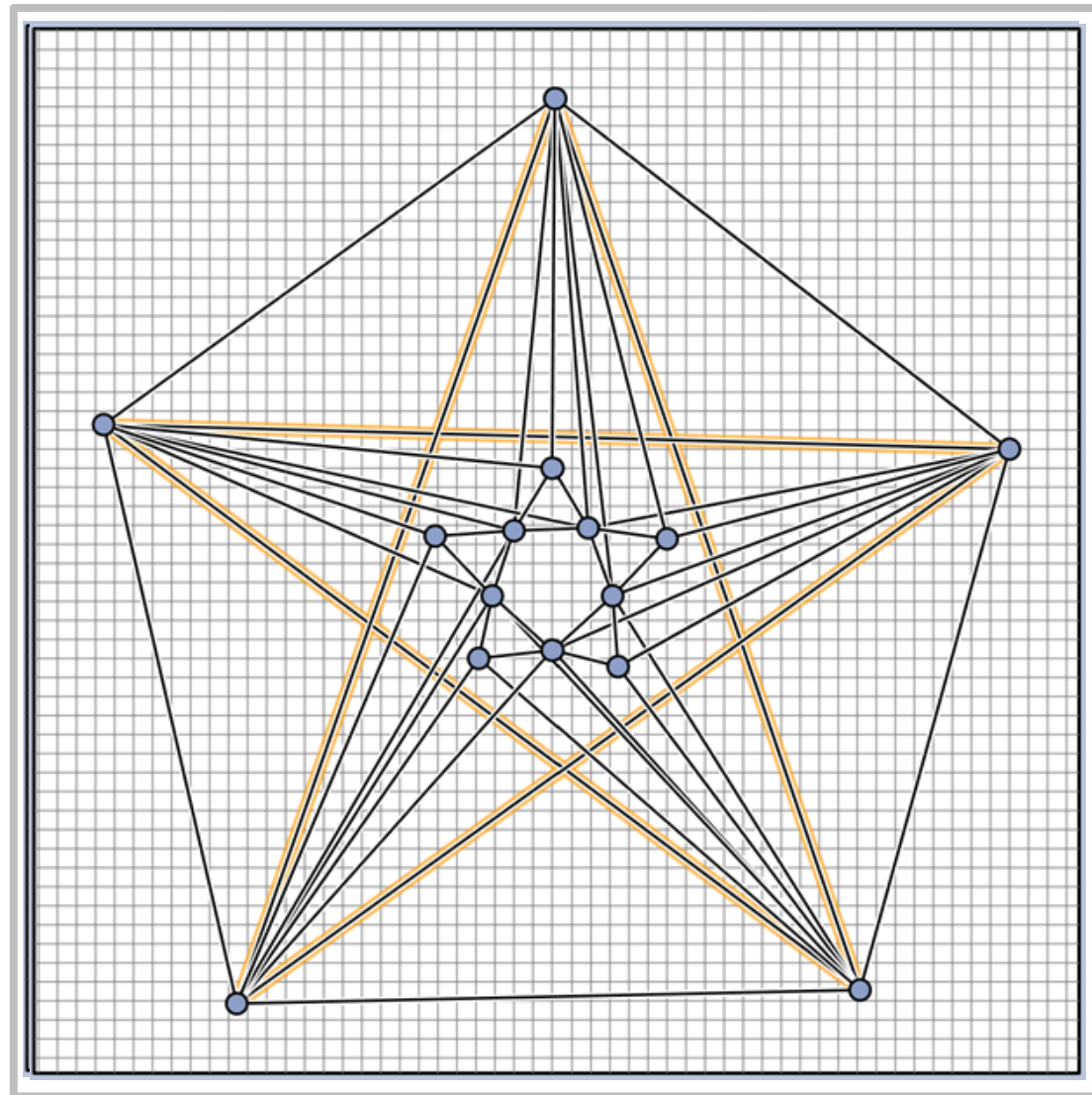
graph **2**



Jules
1-planar

LIVE CHALLENGE

Manual category graphs



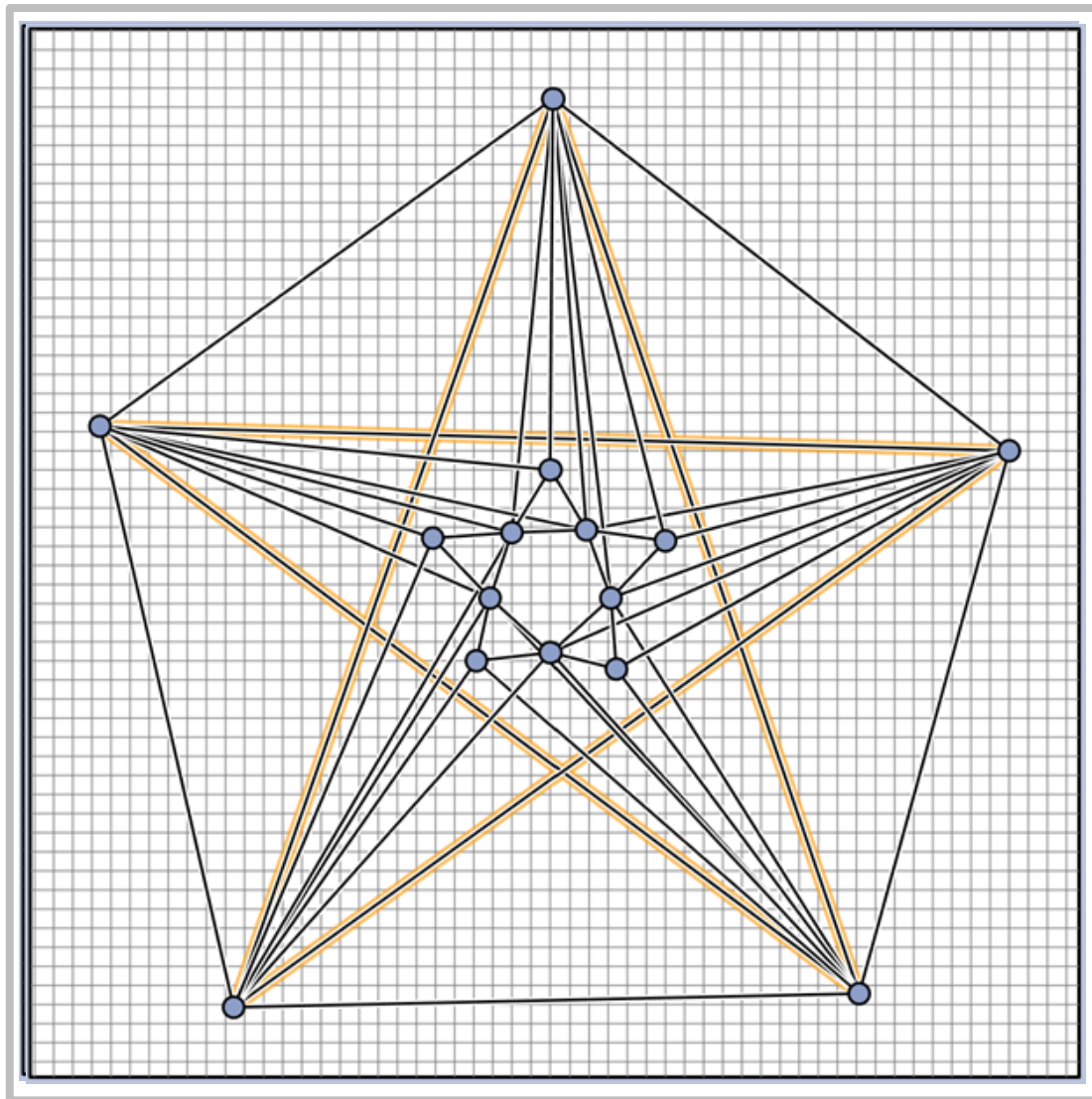
input

graph **3**



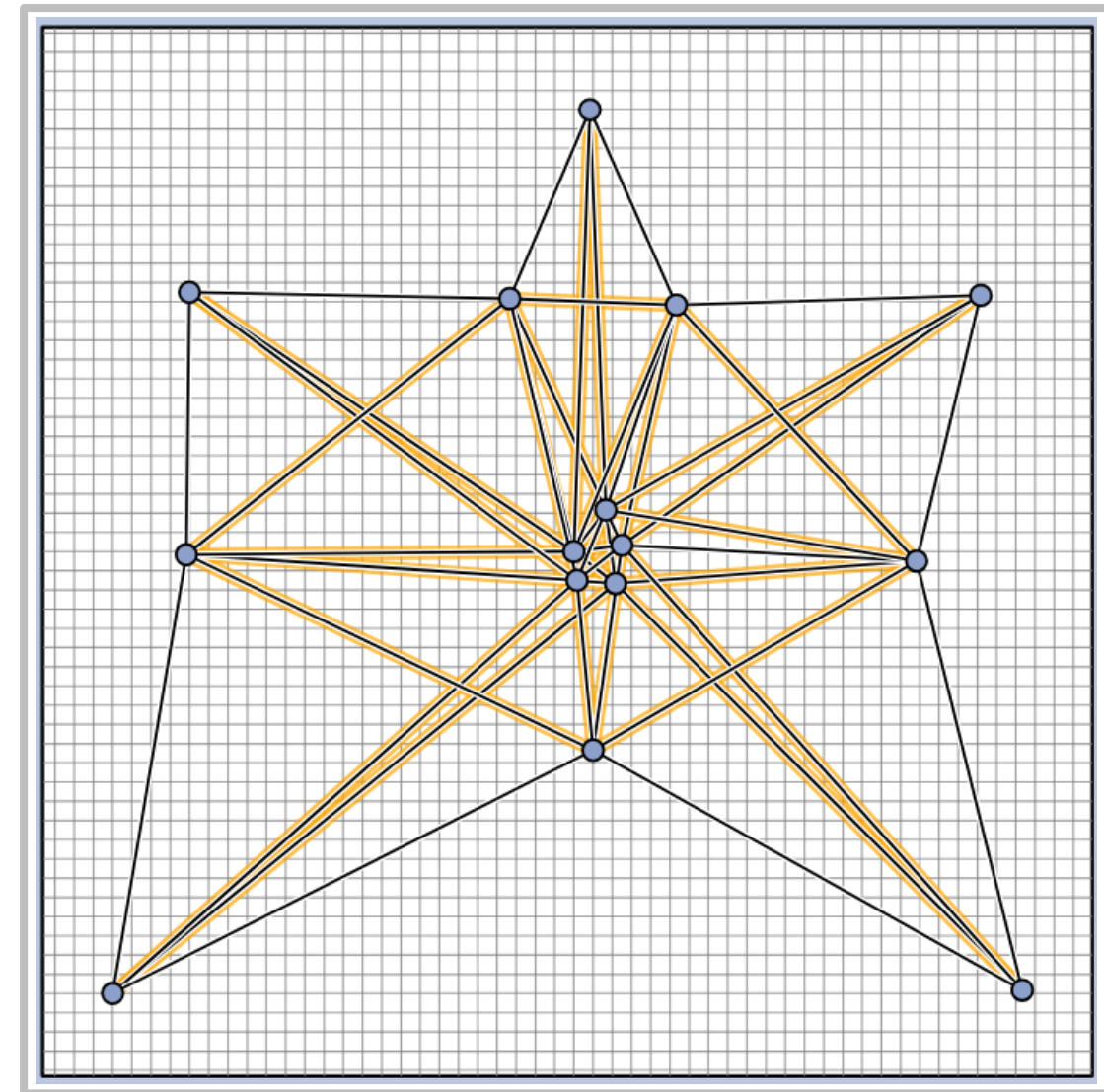
LIVE CHALLENGE

Manual category graphs



input

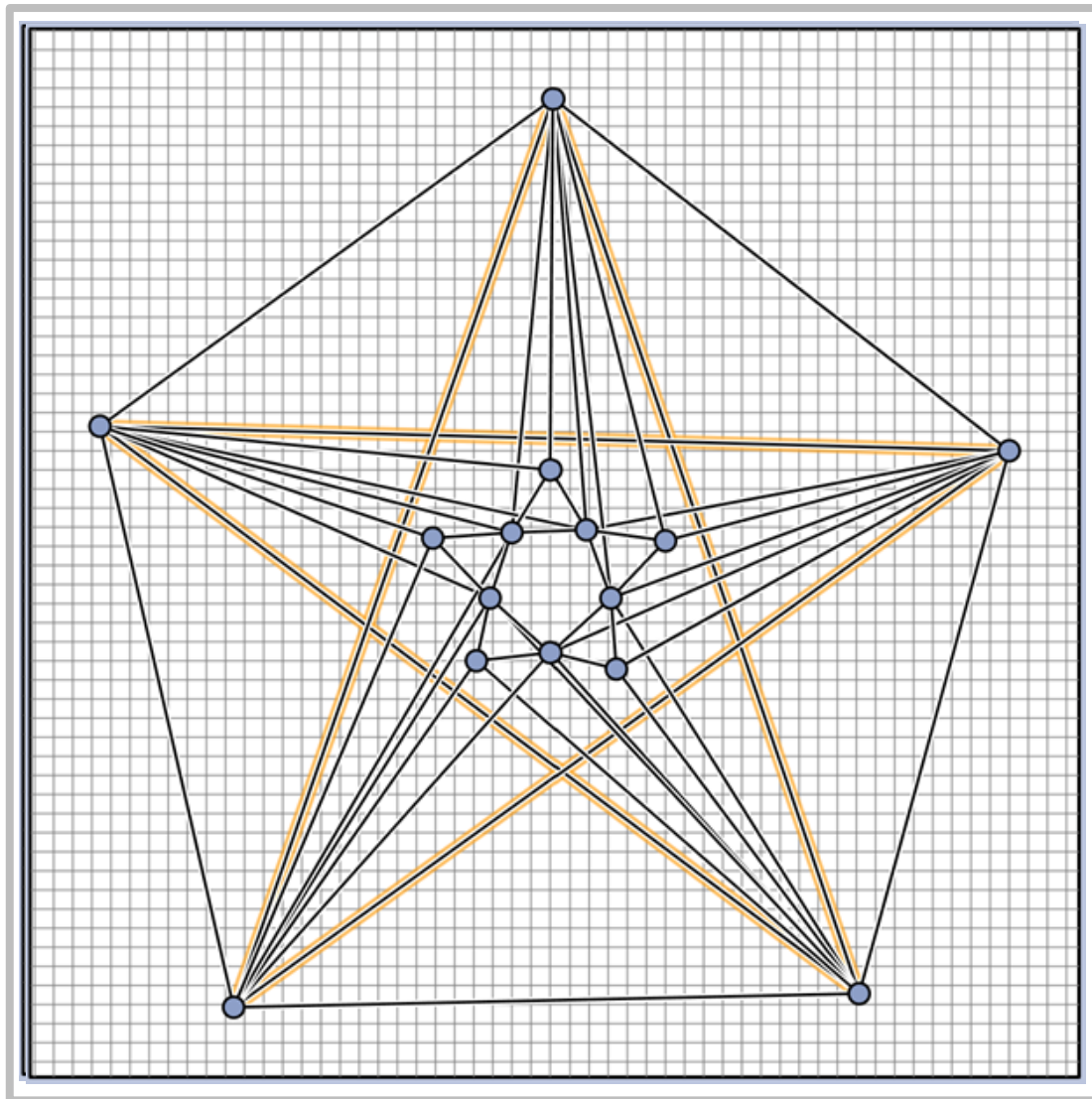
graph **3**



best manual
Charlemagne
2-planar

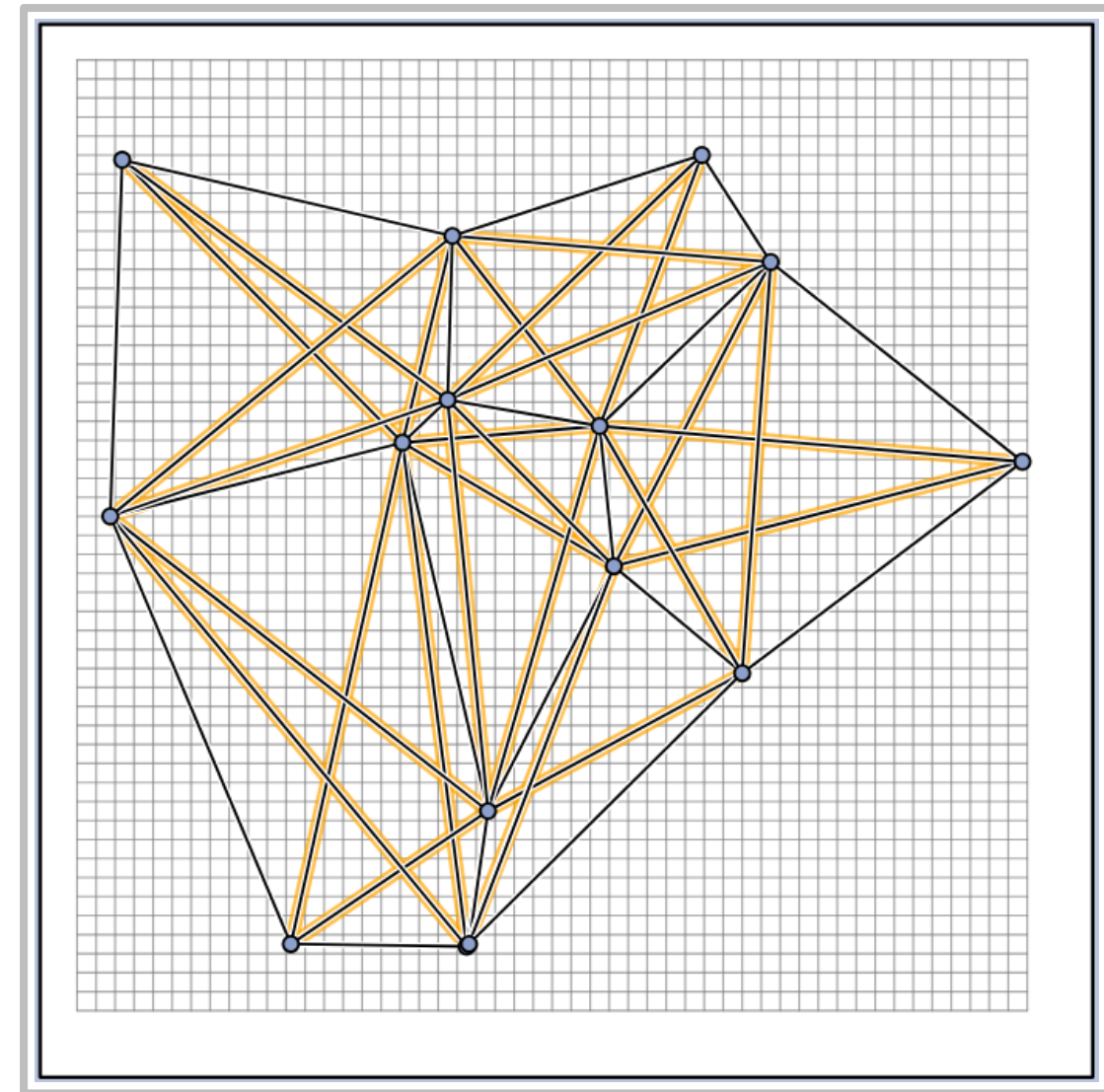
LIVE CHALLENGE

Manual category graphs



input

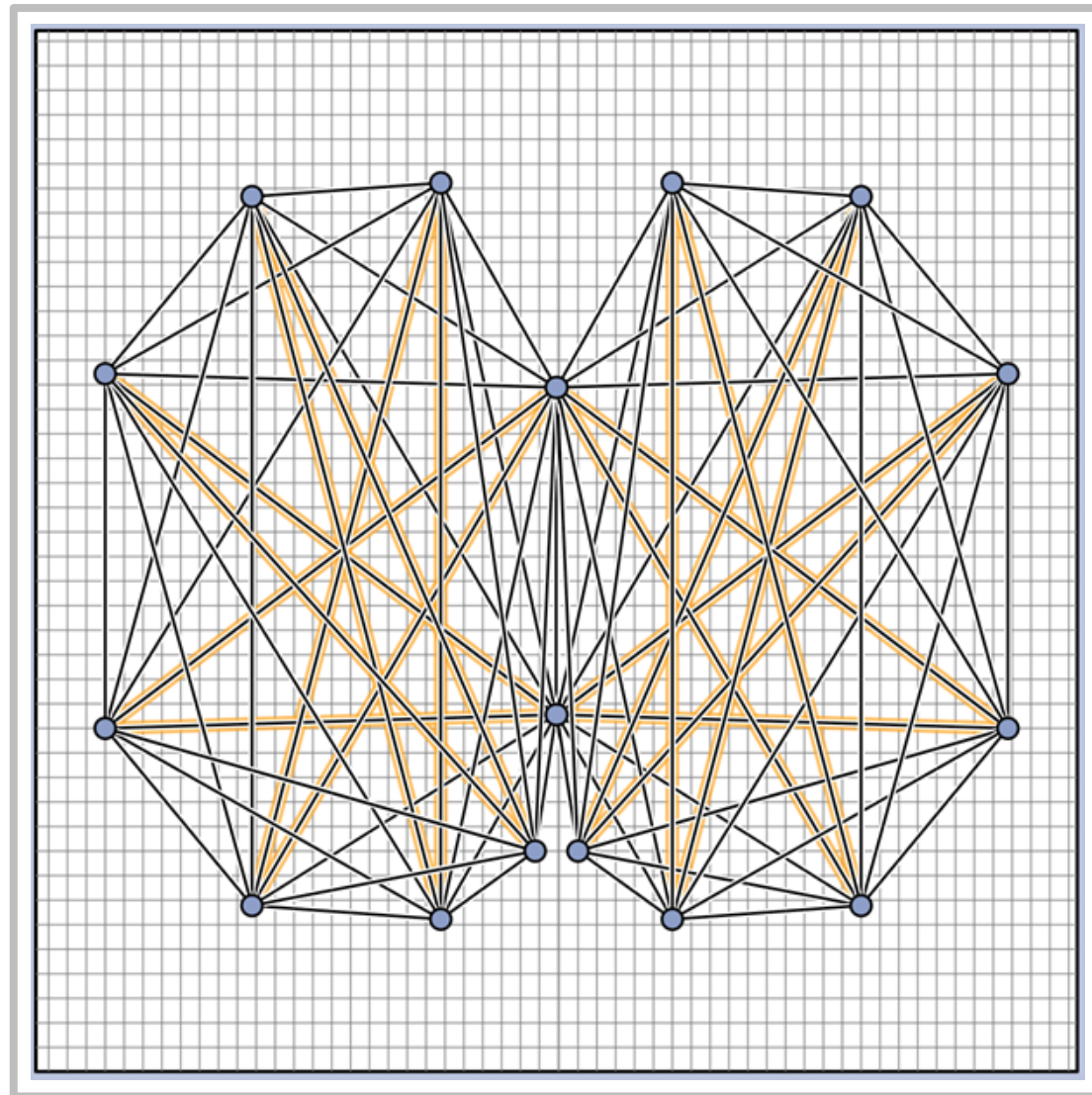
graph **3**



best automatic
G-UOI
2-planar

LIVE CHALLENGE

Manual category graphs



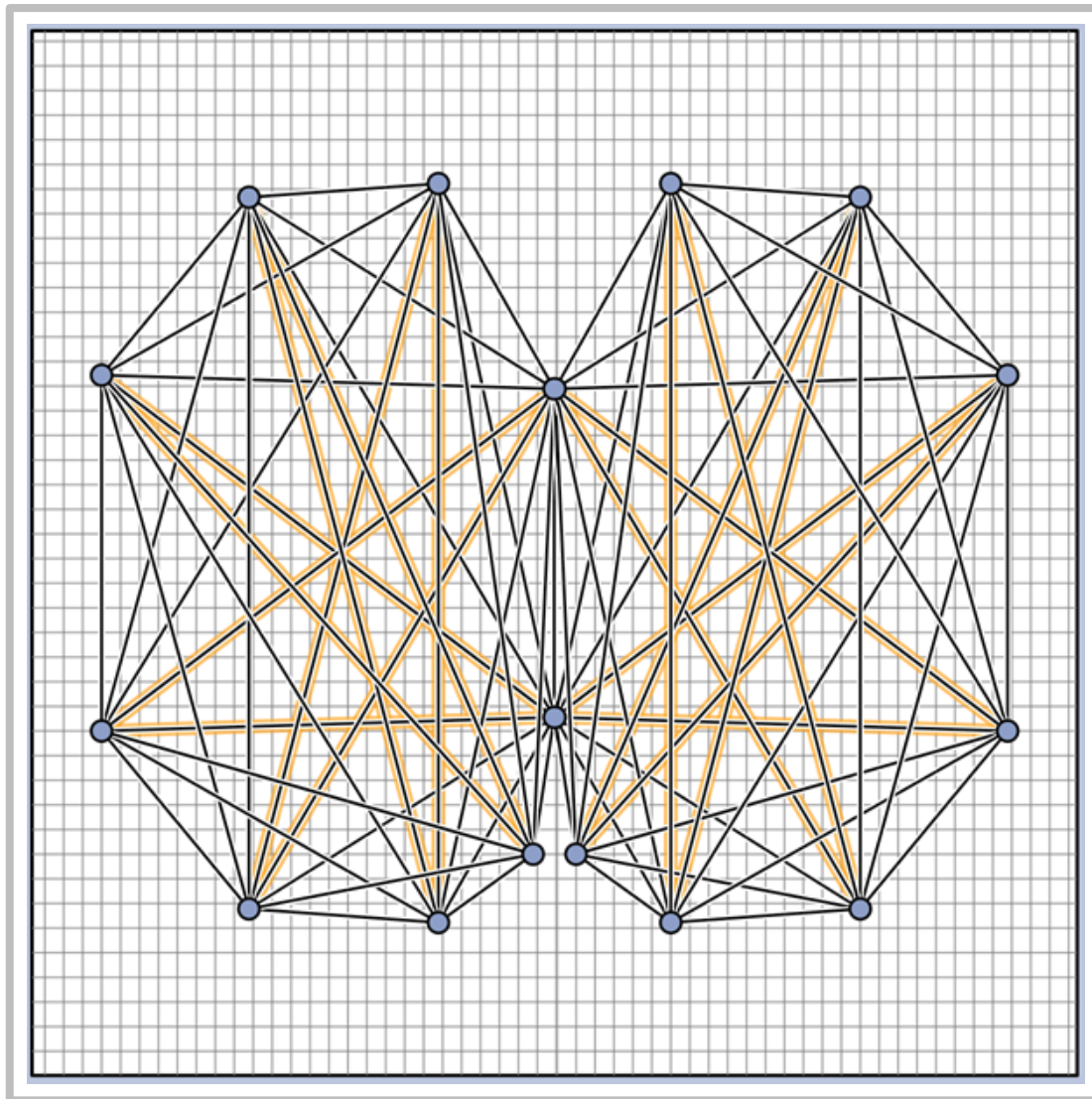
input

graph **4**



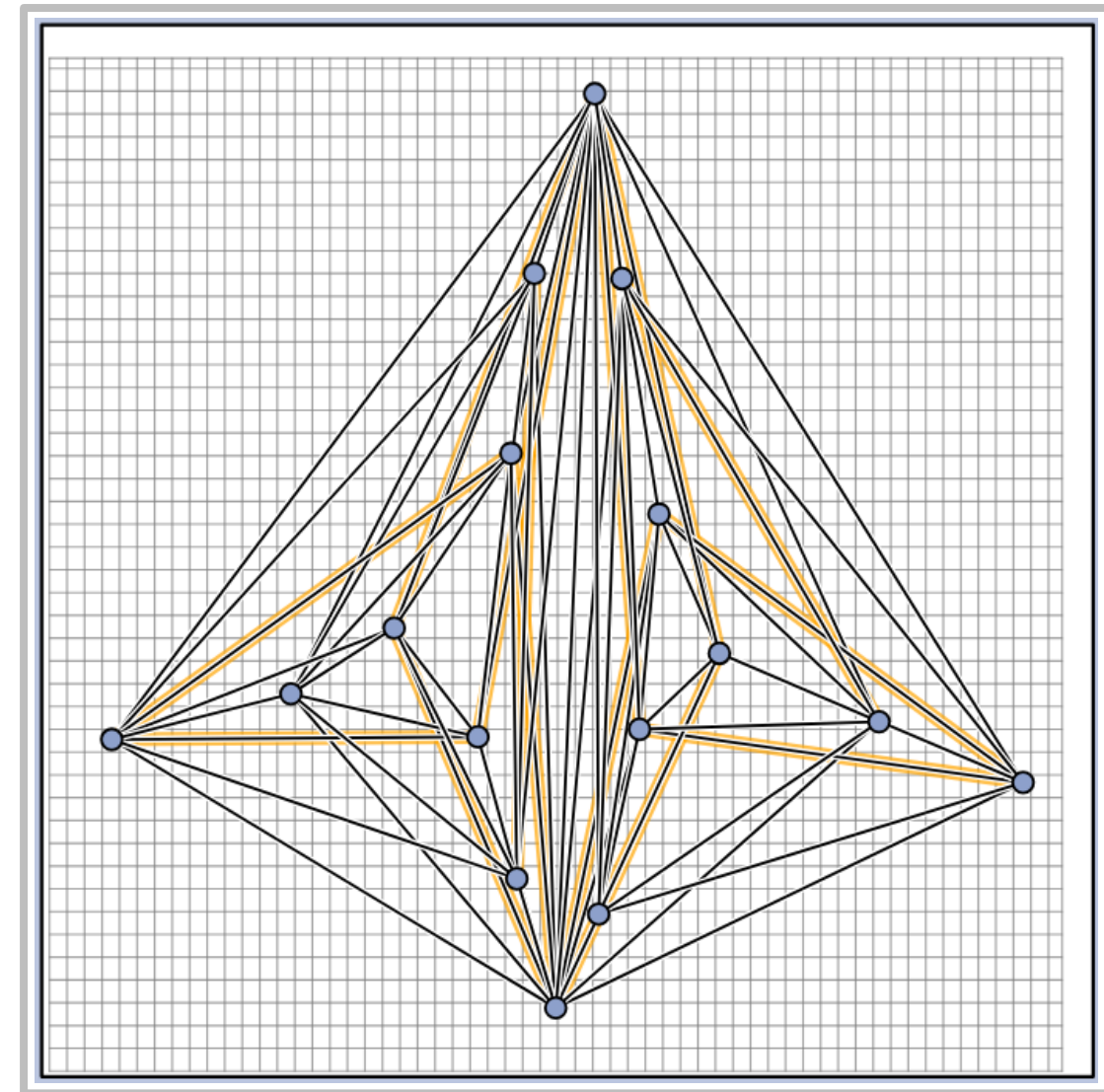
LIVE CHALLENGE

Manual category graphs



input

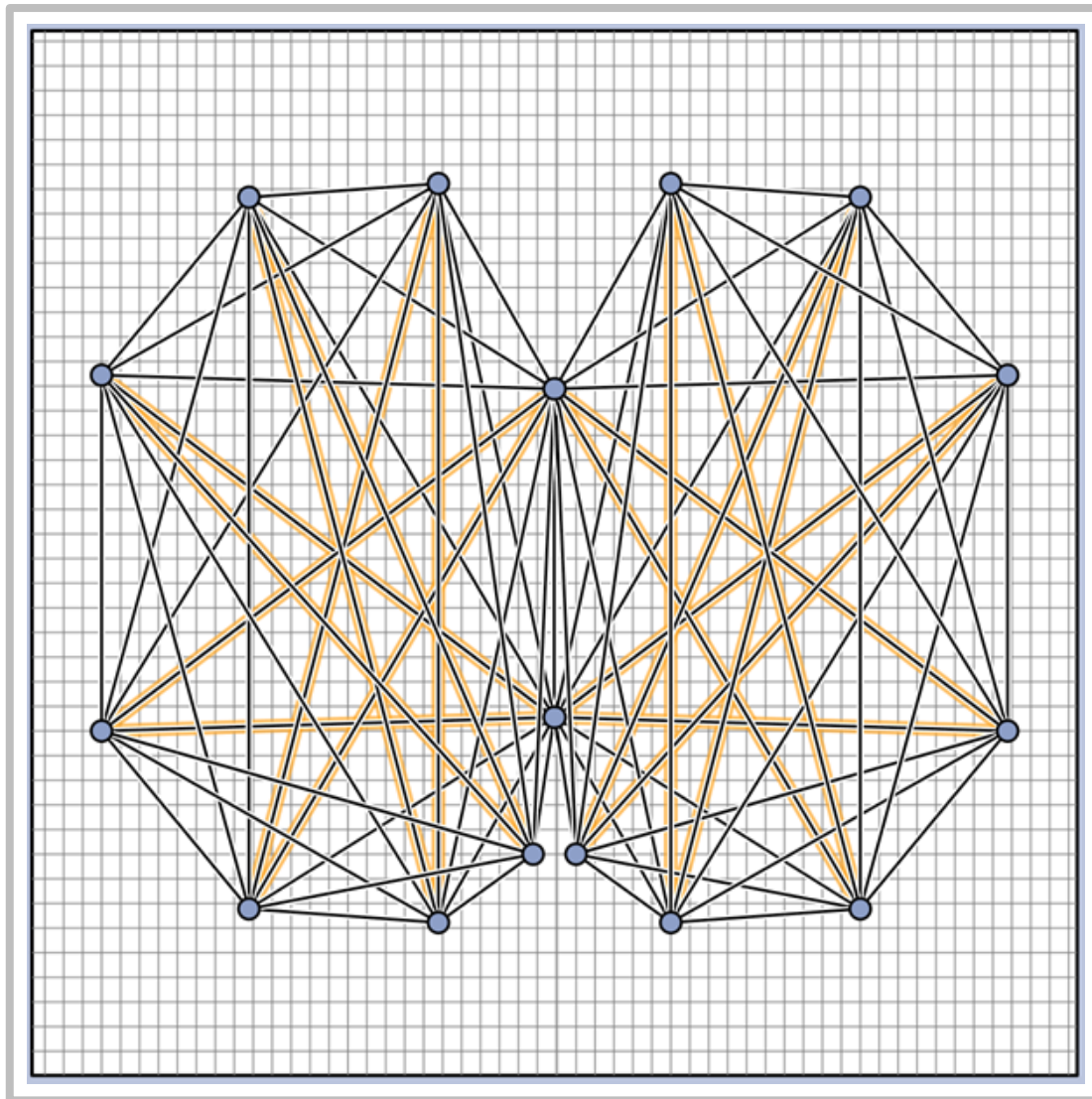
graph 4



best manual
Marcus
4-planar

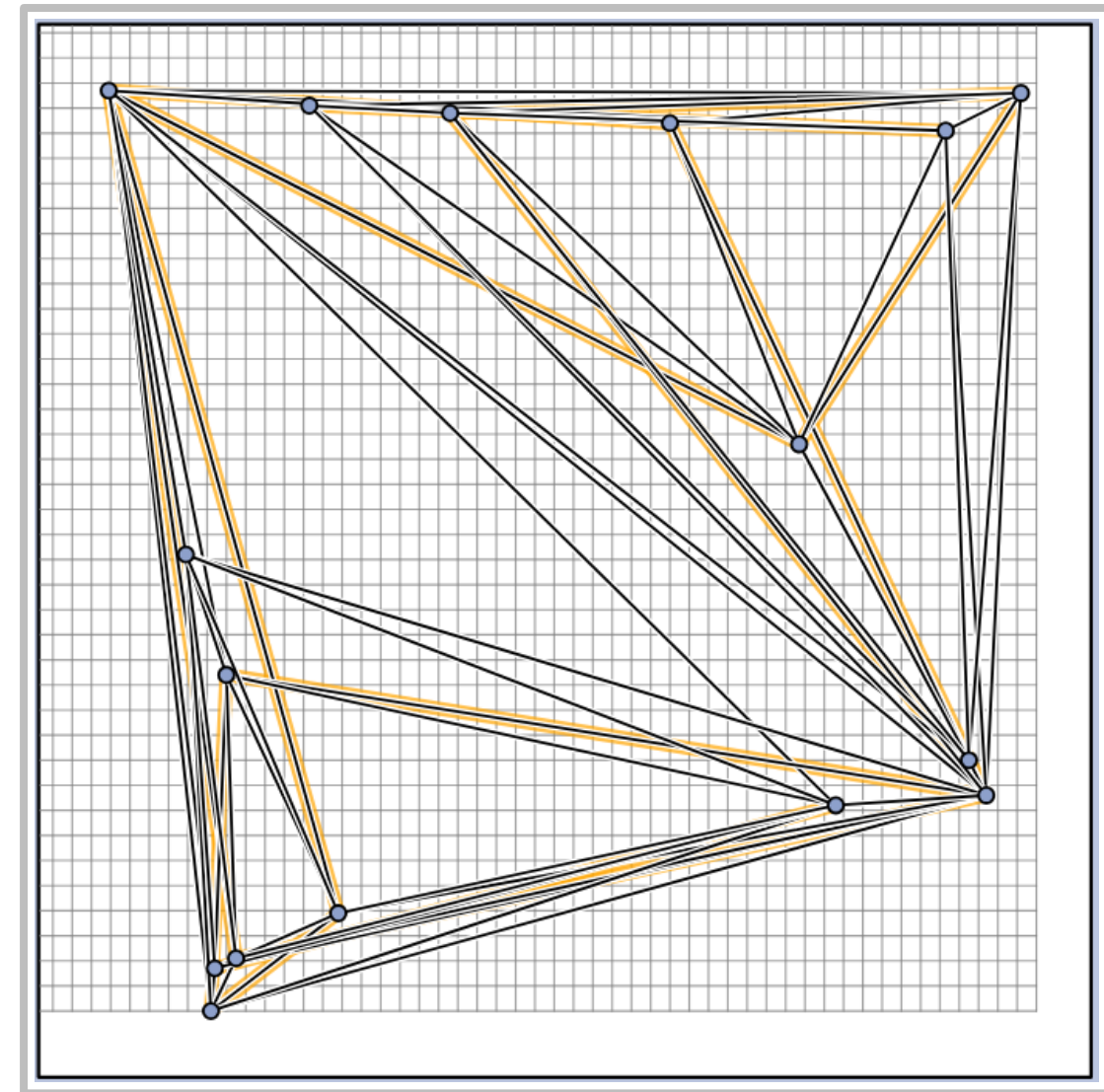
LIVE CHALLENGE

Manual category graphs



input

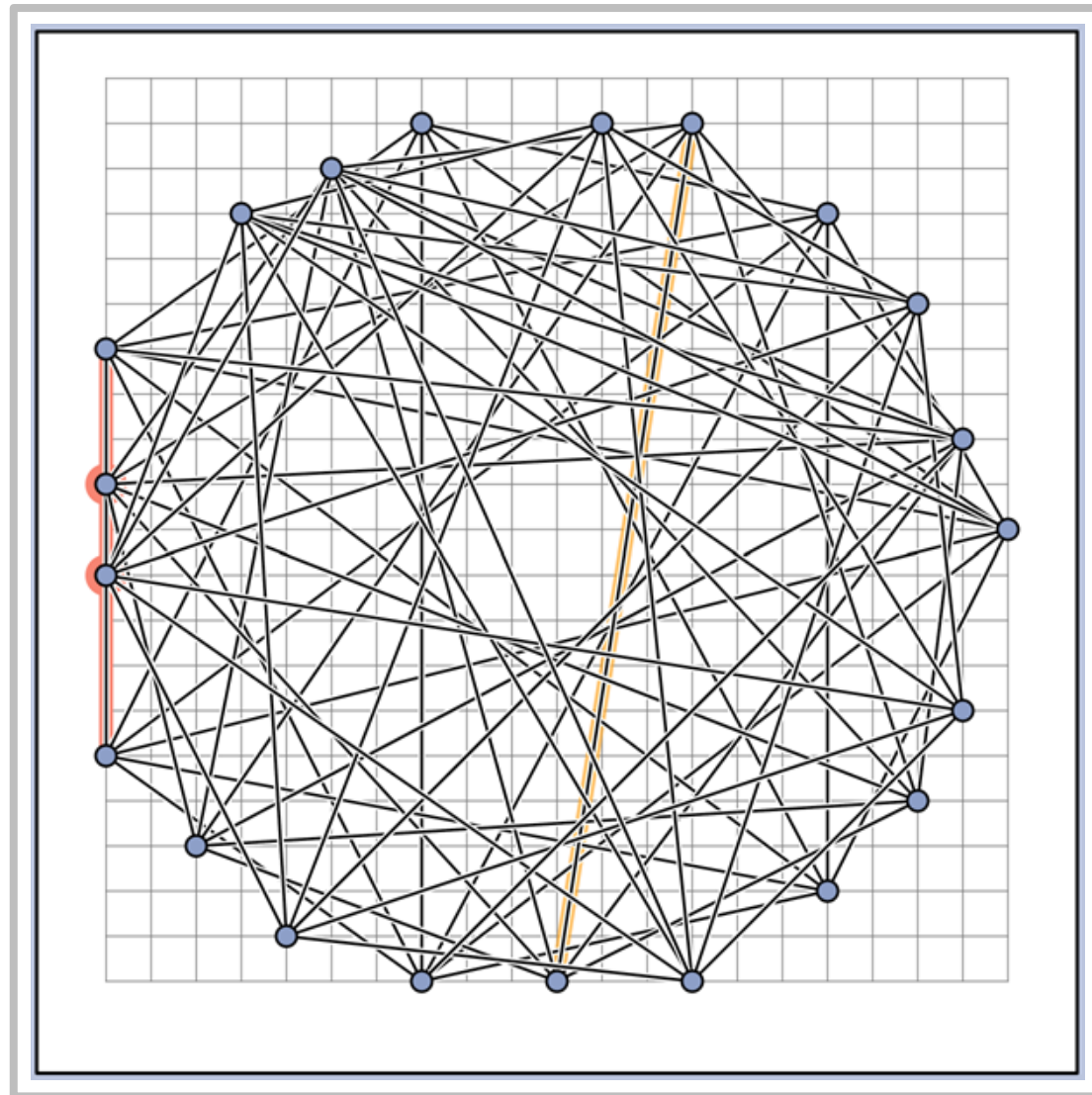
graph **4**



best automatic
Wien1
4-planar

LIVE CHALLENGE

Manual category graphs



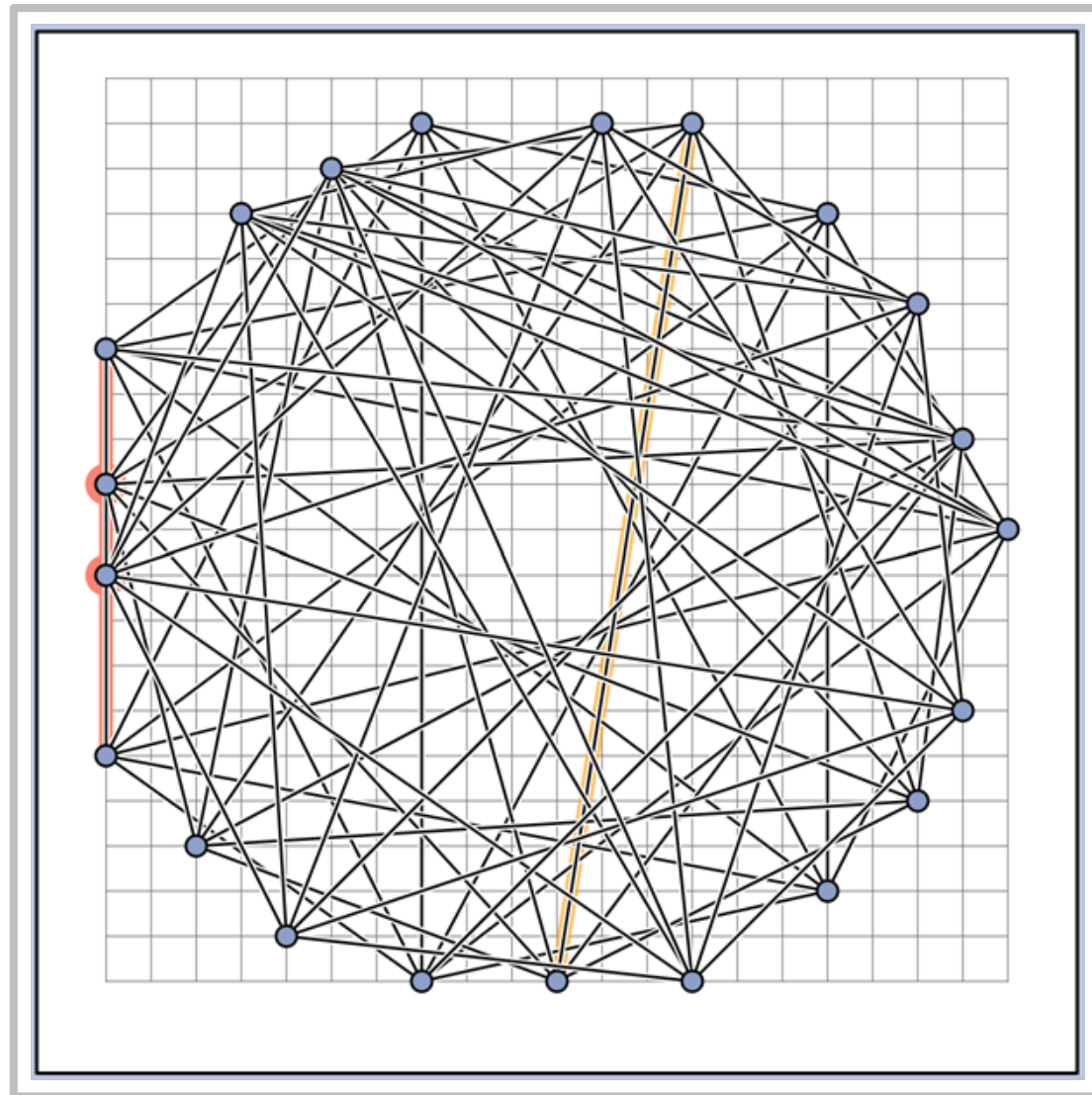
input

graph **5**



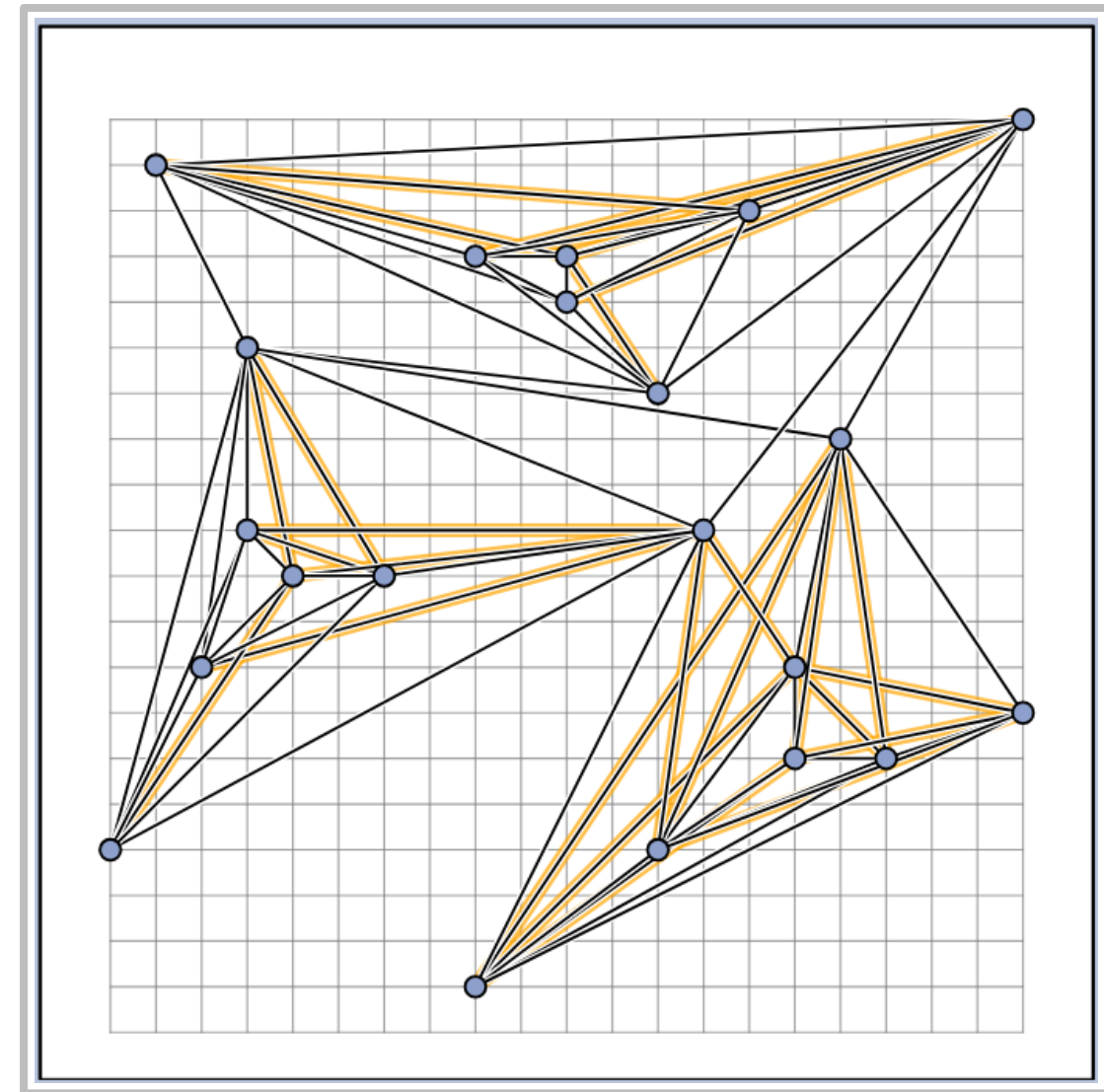
LIVE CHALLENGE

Manual category graphs



input

graph **5**



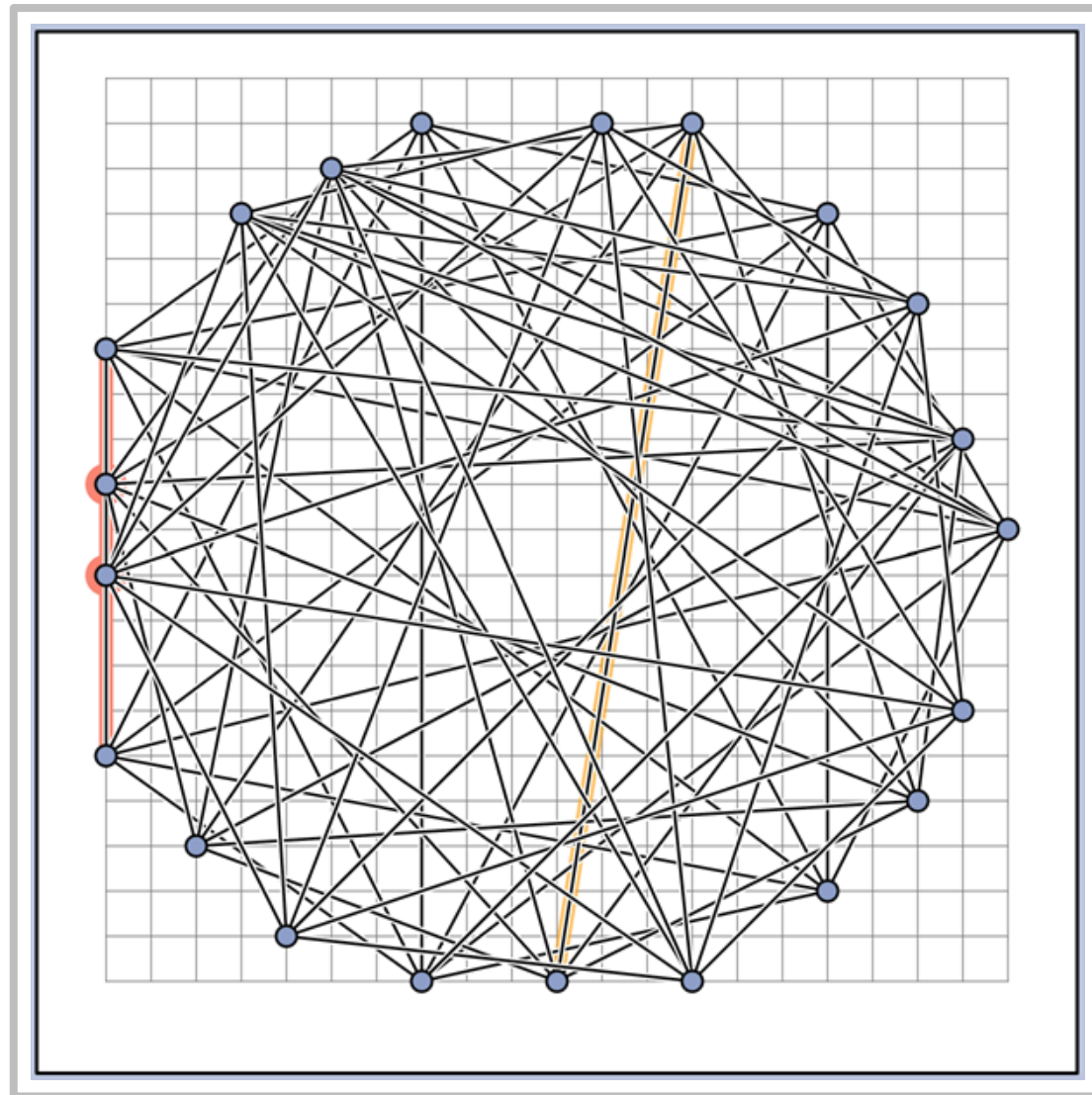
best manual

Wait, it's not crossing maximization?

2-planar

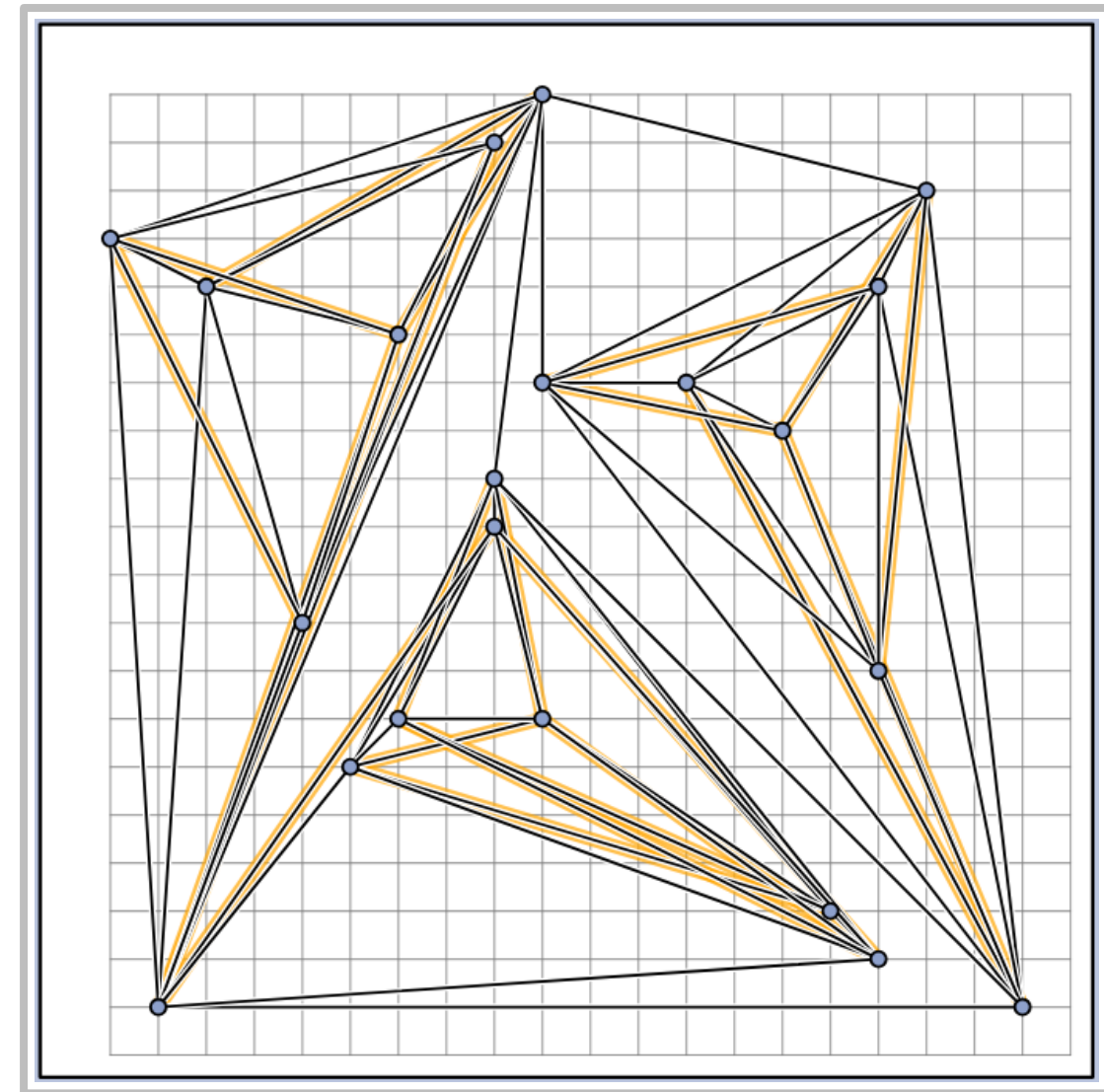
LIVE CHALLENGE

Manual category graphs



input

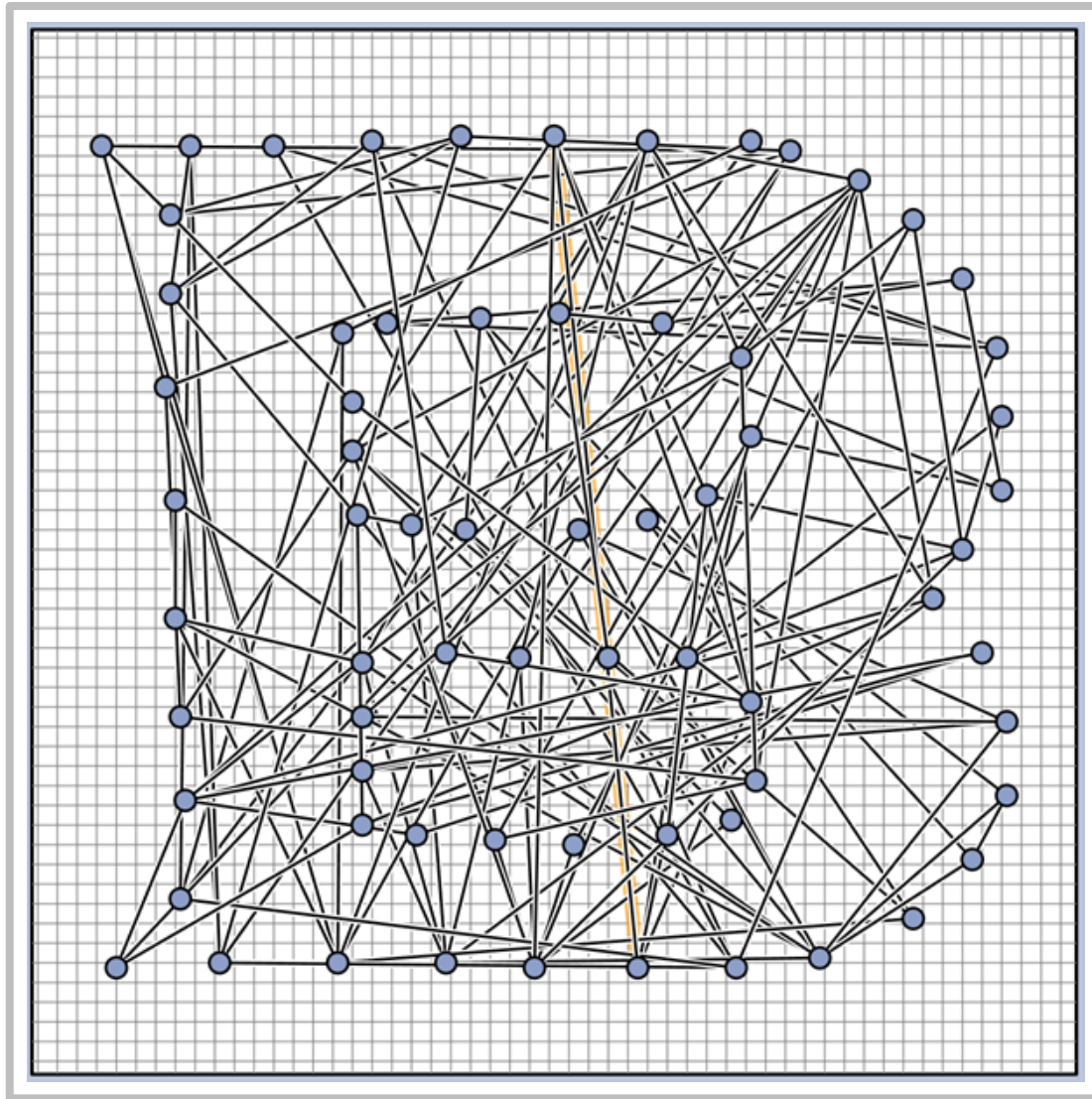
graph **5**



best automatic
Novella
2-planar

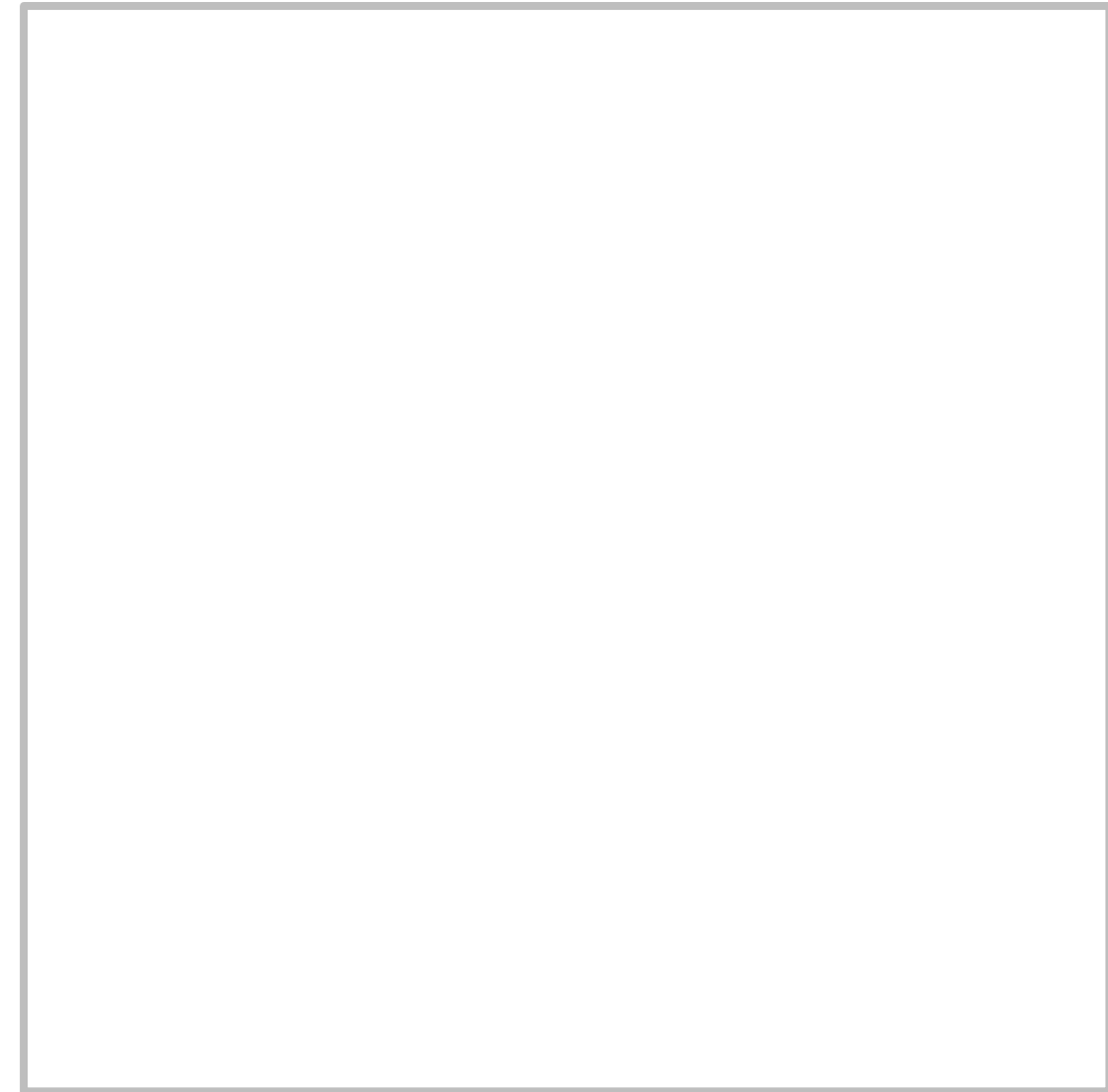
LIVE CHALLENGE

Manual category graphs



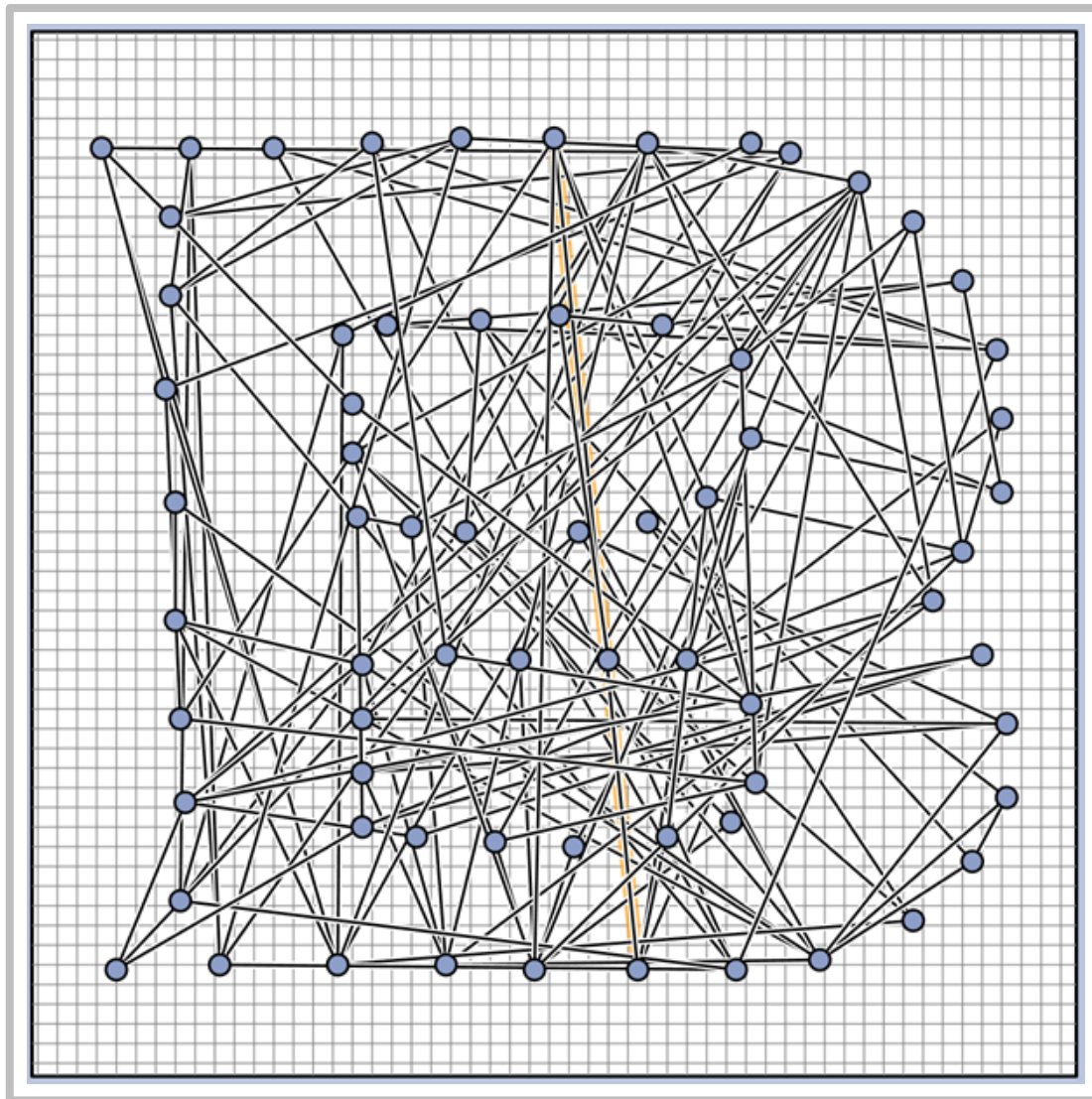
input

graph **6**



LIVE CHALLENGE

Manual category graphs



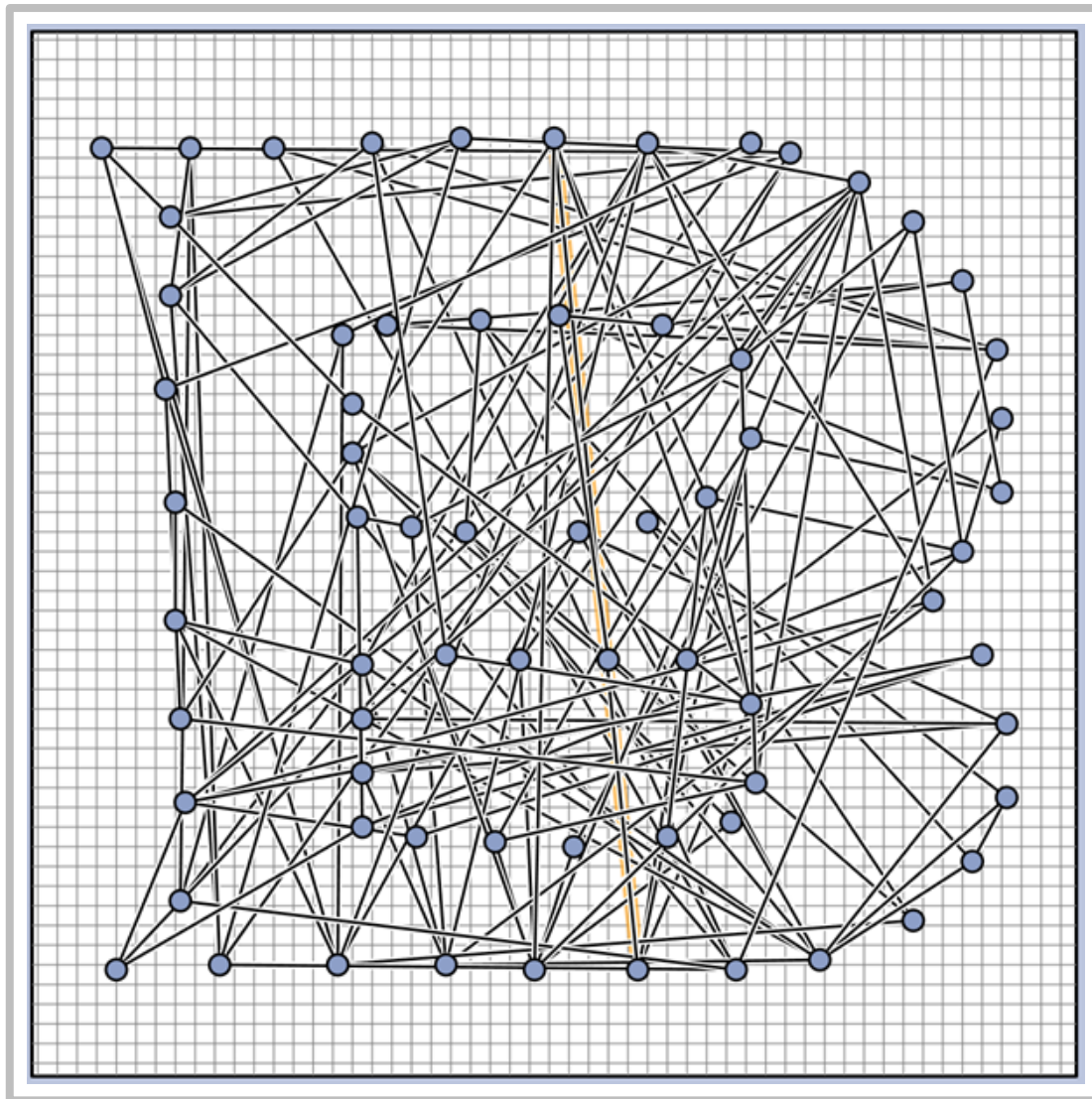
input

graph 6



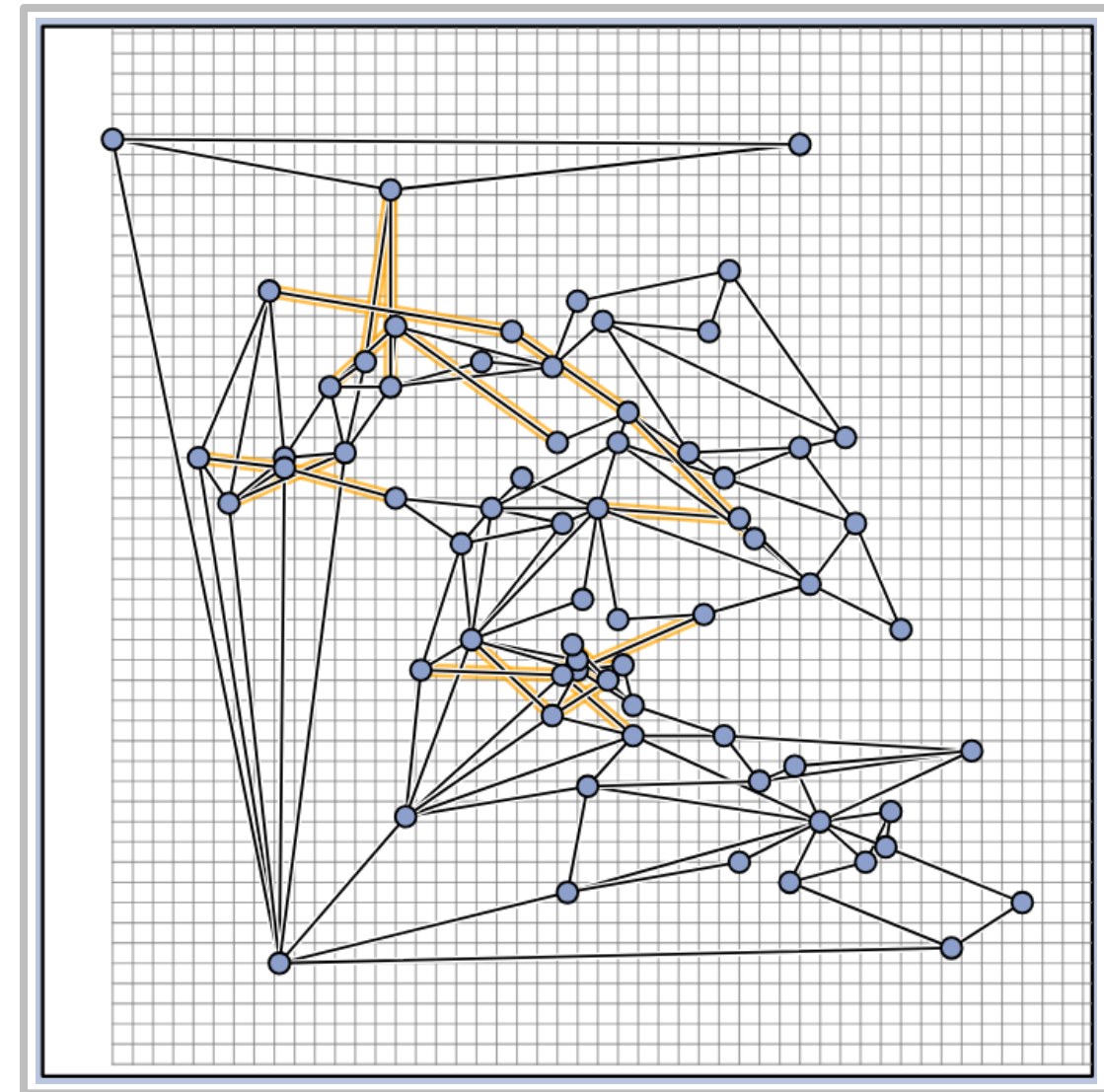
LIVE CHALLENGE

Manual category graphs



input

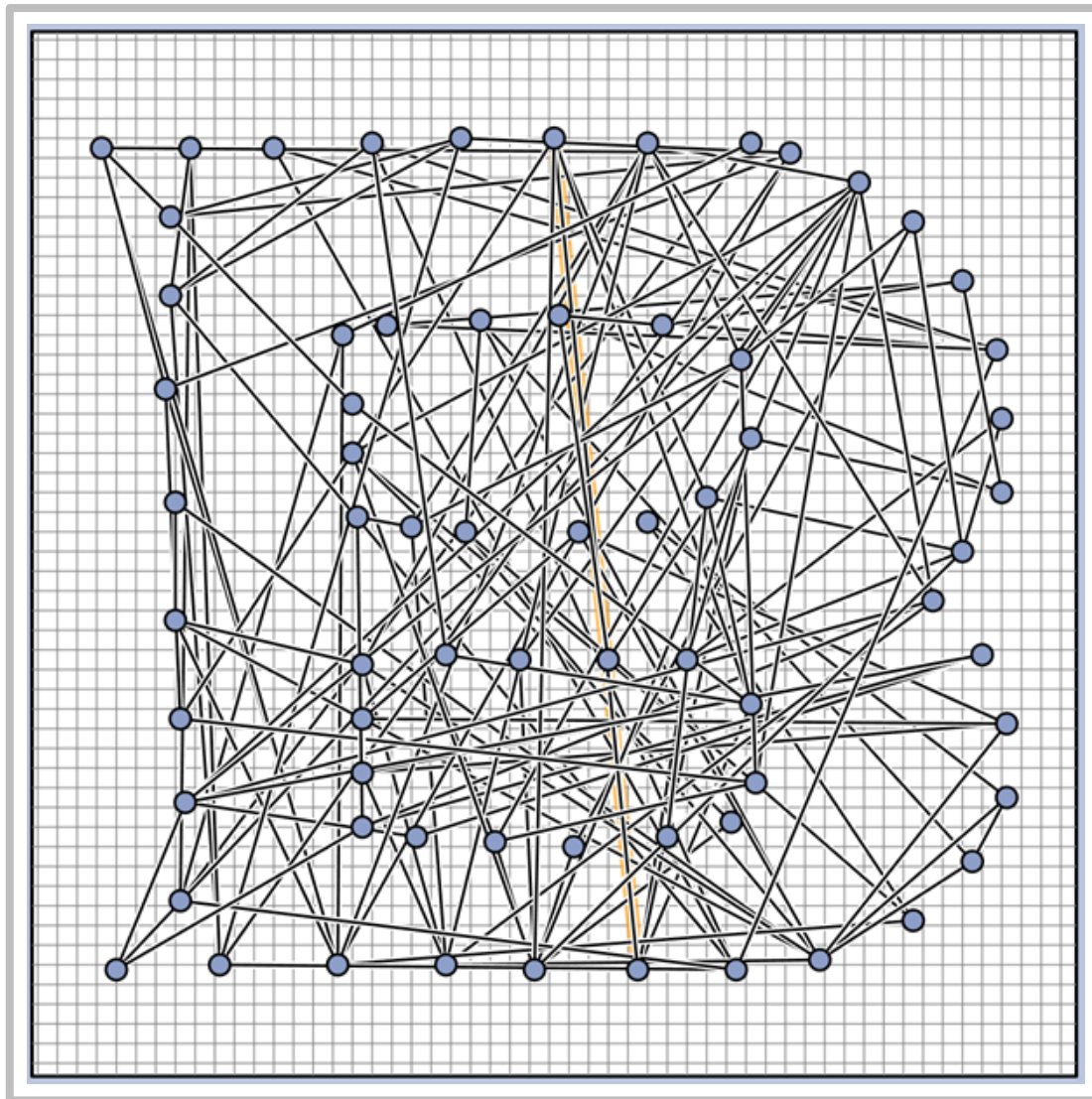
graph 6



best manual
timj 9x
2-planar

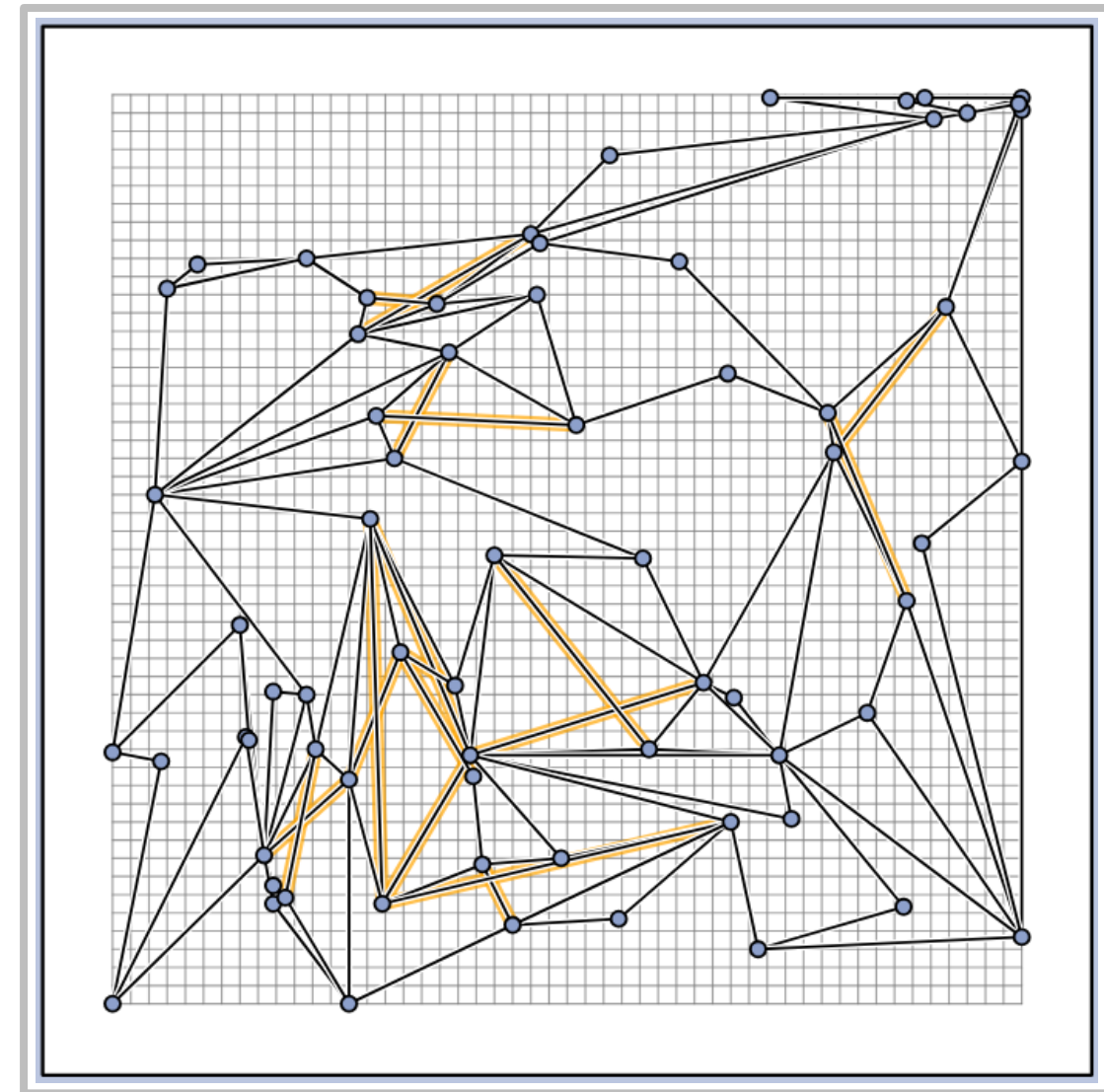
LIVE CHALLENGE

Manual category graphs



input

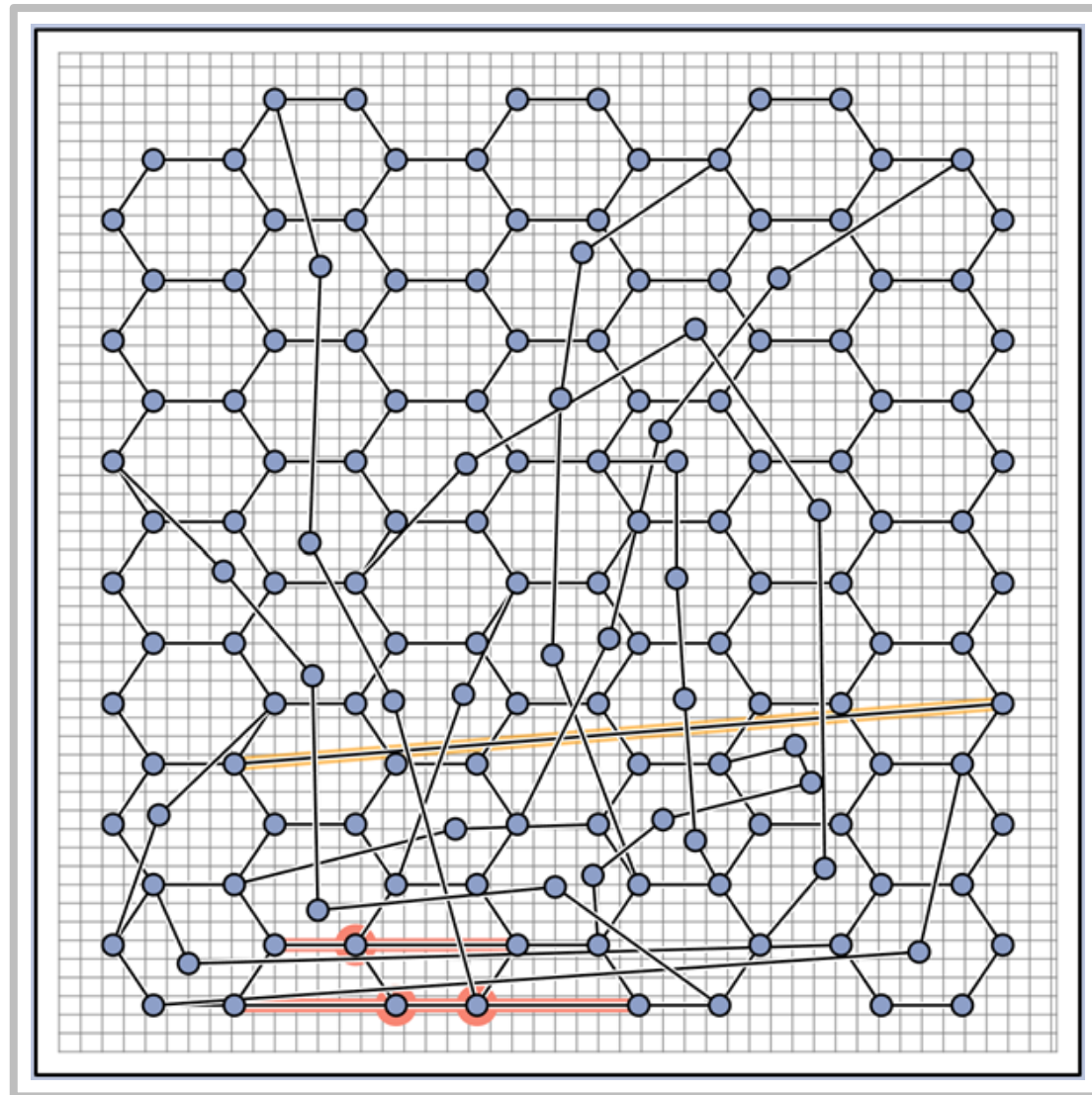
graph **6**



best automatic
SALAHC
1-planar

LIVE CHALLENGE

Manual category graphs



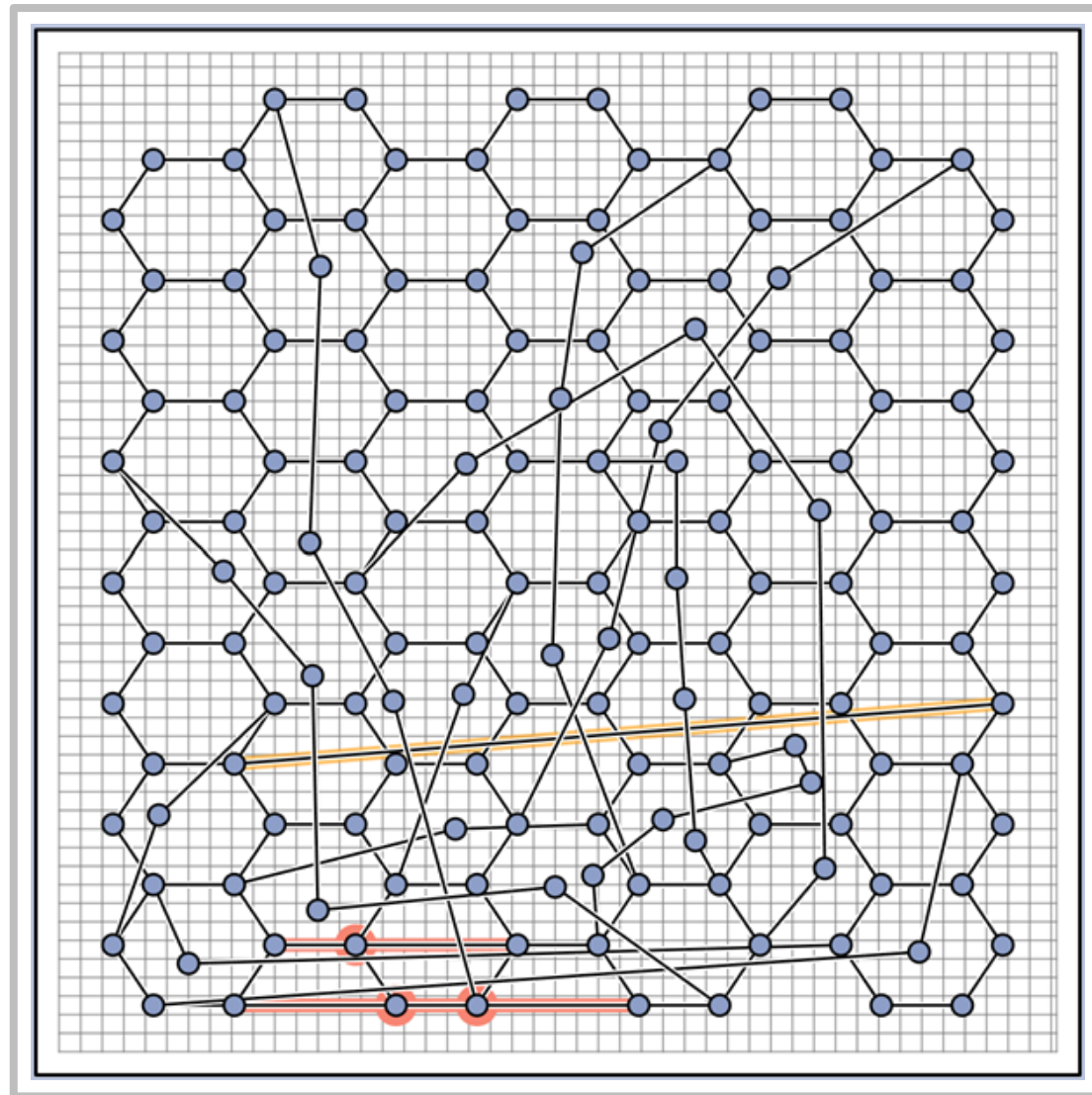
input



graph **7**

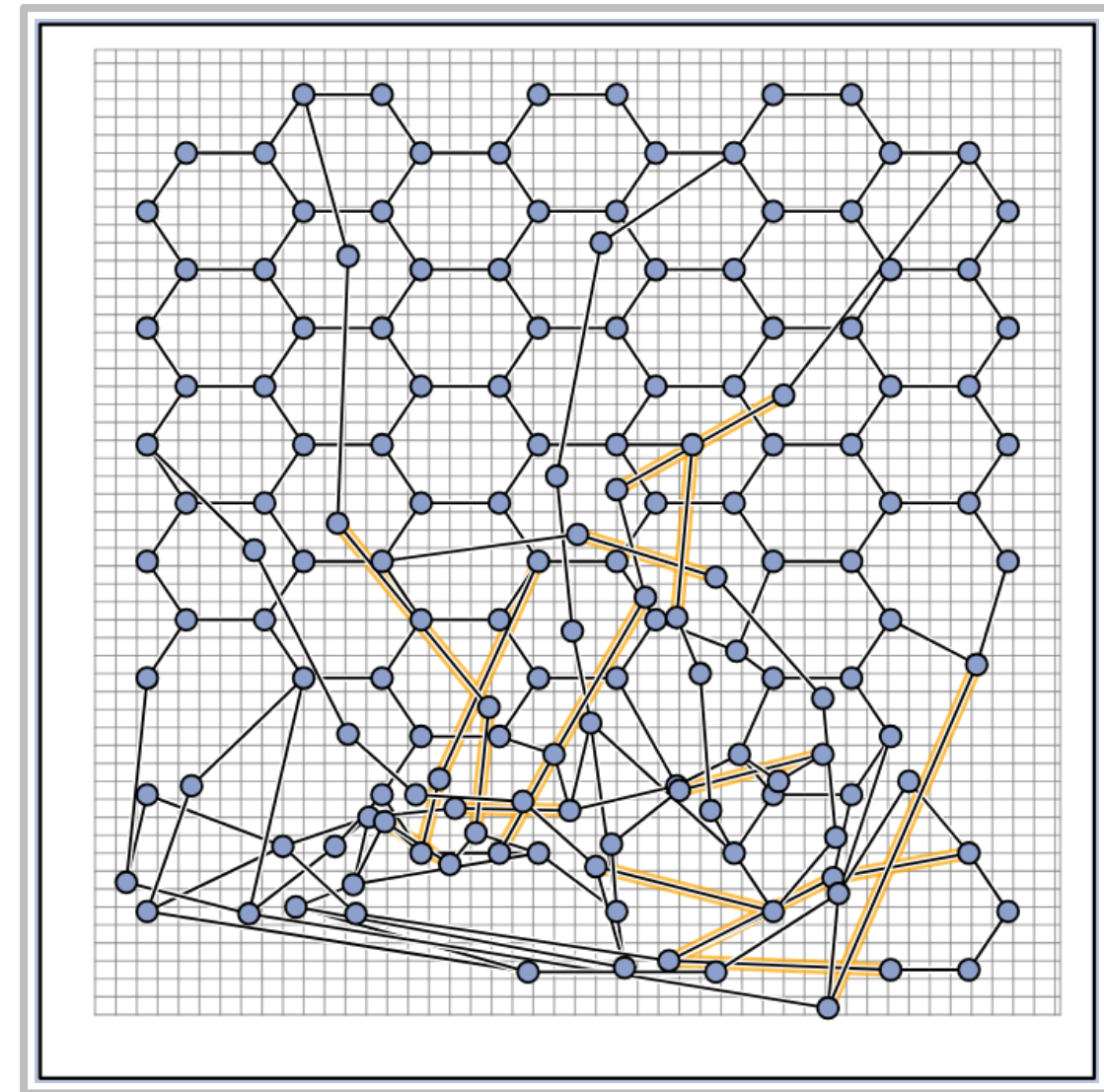
LIVE CHALLENGE

Manual category graphs



input

graph **7**

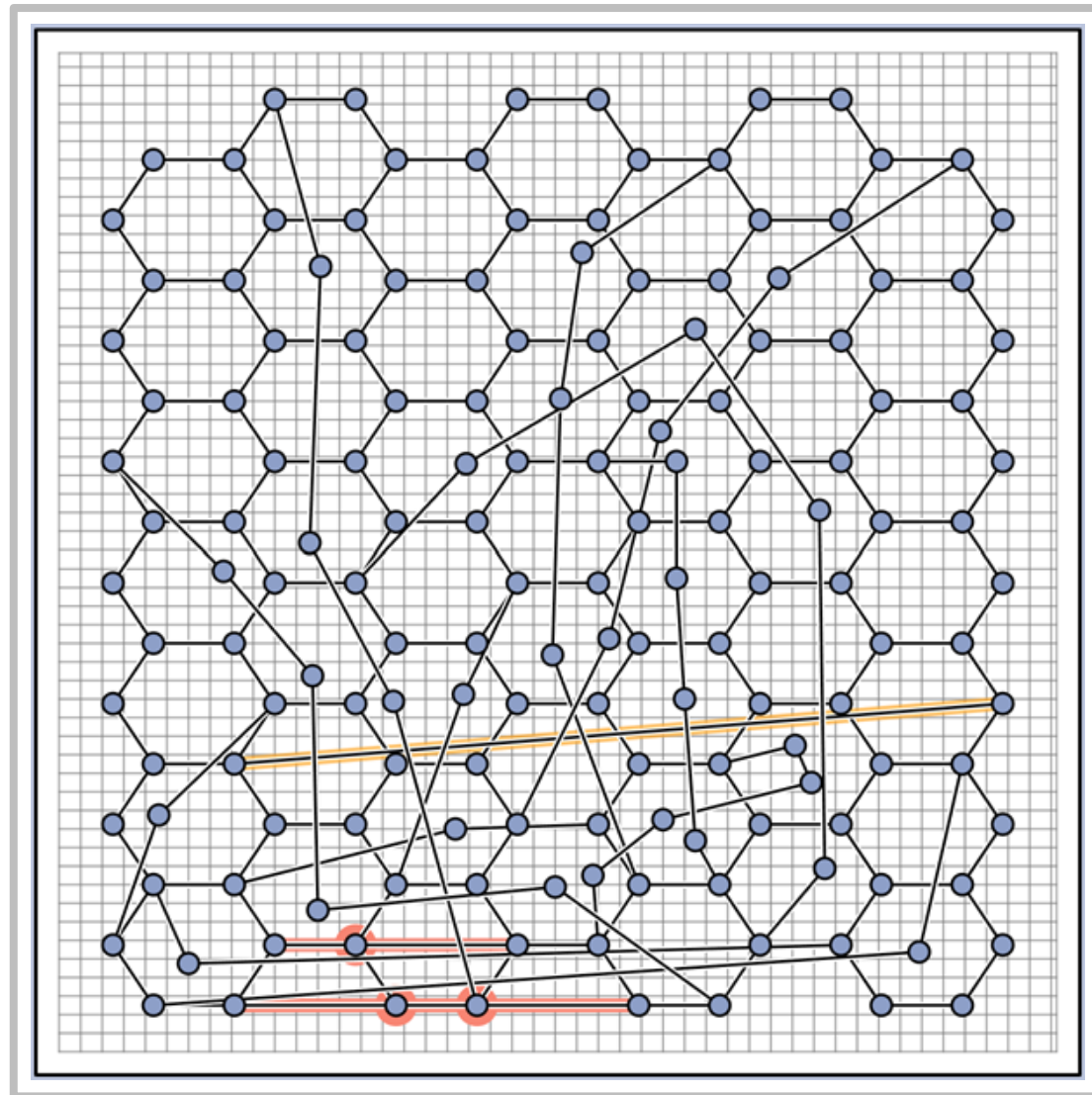


best manual
DamnYellowEdges

3-planar

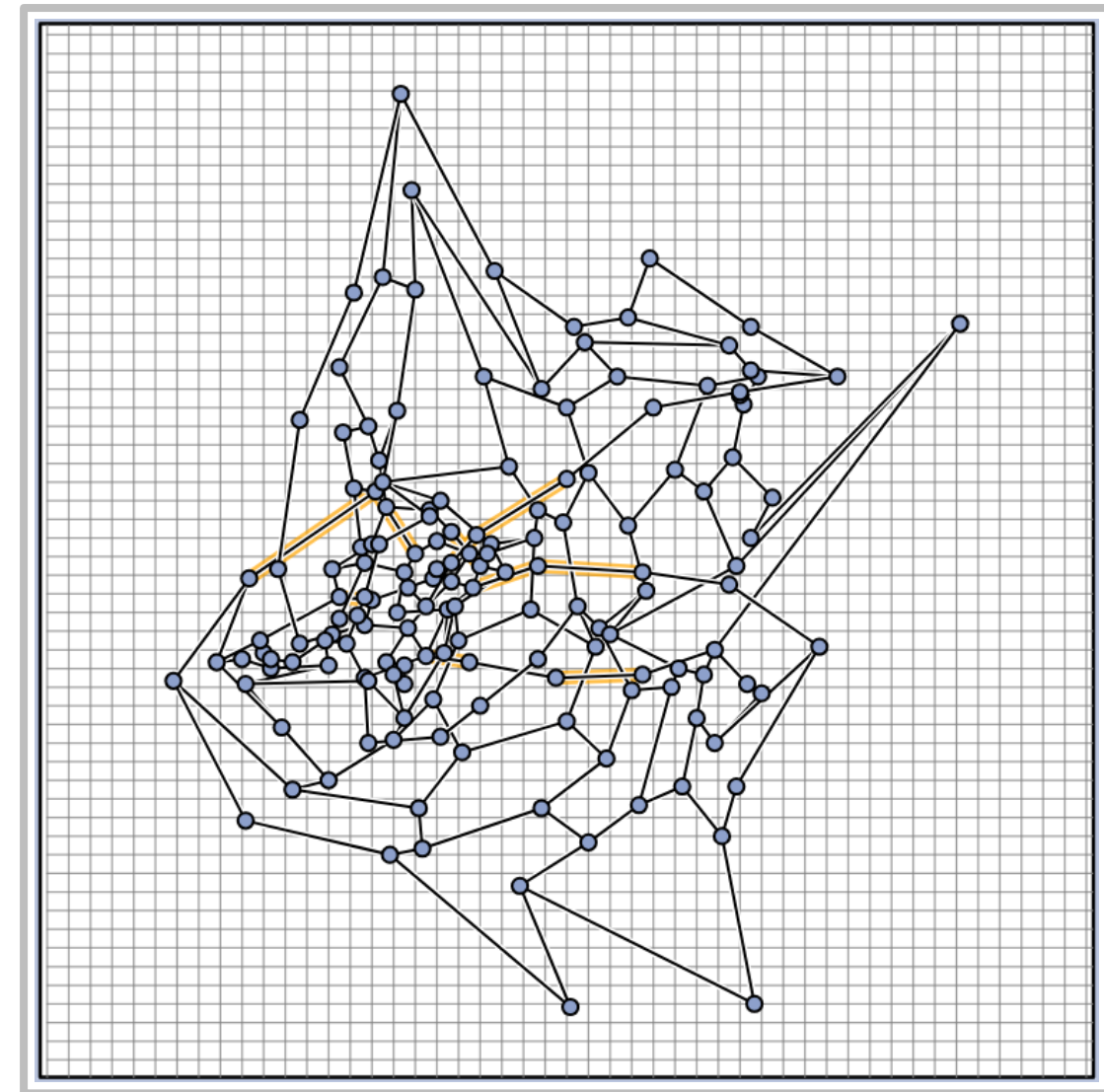
LIVE CHALLENGE

Manual category graphs



input

graph **7**



best automatic
MUCURLULAR
2-planar

LIVE CHALLENGE

Manual category results

LIVE CHALLENGE

Manual category results

The Scores in Category Manual

This contest is over!

Frozen Standings

PLACE	TEAM	SCORE
1	DamnYellowEdges	6.35238988346818
2	timj 9x	6.245804988662131
3	Wait, it's not crossing maximization?	6.129544005102041
4	TeaM Velociraptor	5.587875994579291
5	We eat graphs	5.522563775510204
6	maximum	5.1445913877533584
7	All of a sudden	4.871272034151774
8	Agnes Tachyon	4.8372257270406465
9	Defective team	4.775967778804203
10	Marcus	4.647989373264099
11	TUM-UBC	4.506518104217904
12	Brock VGG 1	4.167630165639663
13	Charlemagne	3.9795649887005595

LIVE CHALLENGE

Manual category results

graph

Wait, it's not cr. max.?

All of a sudden
maximum

DamnYellowEdges

Charlemagne

Brock VGG 1

TUM-UBC

TeaM Velociraptor

Marcus

Agnes Tachyon

timj 9x

Defective team

We eat graphs

LIVE CHALLENGE

Manual category results

graph	1
Wait, it's not cr. max.?	1
All of a sudden	1
maximum	1
DamnYellowEdges	1
Charlemagne	1
Brock VGG 1	1
TUM-UBC	1
TeaM Velociraptor	1
Marcus	1
Agnes Tachyon	1
timj 9x	1
Defective team	1
We eat graphs	1

LIVE CHALLENGE

Manual category results

graph	1	2
Wait, it's not cr. max.?	1	3
All of a sudden	1	4
maximum	1	3
DamnYellowEdges	1	2
Charlemagne	1	5
Brock VGG 1	1	4
TUM-UBC	1	4
TeaM Velociraptor	1	3
Marcus	1	3
Agnes Tachyon	1	3
timj 9x	1	2
Defective team	1	5
We eat graphs	1	2

LIVE CHALLENGE

Manual category results

graph	1	2	3
Wait, it's not cr. max.?	1	3	2
All of a sudden	1	4	2
maximum	1	3	2
DamnYellowEdges	1	2	2
Charlemagne	1	5	2
Brock VGG 1	1	4	2
TUM-UBC	1	4	2
TeaM Velociraptor	1	3	2
Marcus	1	3	4
Agnes Tachyon	1	3	4
timj 9x	1	2	4
Defective team	1	5	4
We eat graphs	1	2	2

LIVE CHALLENGE

Manual category results

graph	1	2	3	4
Wait, it's not cr. max.?	1	3	2	4
All of a sudden	1	4	2	9
maximum	1	3	2	8
DamnYellowEdges	1	2	2	5
Charlemagne	1	5	2	12
Brock VGG 1	1	4	2	9
TUM-UBC	1	4	2	11
TeaM Velociraptor	1	3	2	4
Marcus	1	3	4	4
Agnes Tachyon	1	3	4	6
timj 9x	1	2	4	4
Defective team	1	5	4	6
We eat graphs	1	2	2	6

LIVE CHALLENGE

Manual category results

graph	1	2	3	4
Wait, it's not cr. max.?	1	3	2	4
All of a sudden	1	4	2	9
maximum	1	3	2	8
DamnYellowEdges	1	2	2	5
Charlemagne	1	5	2	12
Brock VGG 1	1	4	2	9
TUM-UBC	1	4	2	11
TeaM Velociraptor	1	3	2	4
Marcus	1	3	4	4
Agnes Tachyon	1	3	4	6
timj 9x	1	2	4	4
Defective team	1	5	4	6
We eat graphs	1	2	2	6



LIVE CHALLENGE

Manual category results

graph	1	2	3	4	5
Wait, it's not cr. max.?	1	3	2	4	2
All of a sudden	1	4	2	9	5
maximum	1	3	2	8	6
DamnYellowEdges	1	2	2	5	3
Charlemagne	1	5	2	12	12
Brock VGG 1	1	4	2	9	4
TUM-UBC	1	4	2	11	6
TeaM Velociraptor	1	3	2	4	4
Marcus	1	3	4	4	4
Agnes Tachyon	1	3	4	6	6
timj 9x	1	2	4	4	2
Defective team	1	5	4	6	4
We eat graphs	1	2	2	6	4

LIVE CHALLENGE

Manual category results

graph	1	2	3	4	5
Wait, it's not cr. max.?	1	3	2	4	2
All of a sudden	1	4	2	9	5
maximum	1	3	2	8	6
DamnYellowEdges	1	2	2	5	3
Charlemagne	1	5	2	12	12
Brock VGG 1	1	4	2	9	4
TUM-UBC	1	4	2	11	6
TeaM Velociraptor	1	3	2	4	4
Marcus	1	3	4	4	4
Agnes Tachyon	1	3	4	6	6
timj 9x	1	2	4	4	2
Defective team	1	5	4	6	4
We eat graphs	1	2	2	6	4



LIVE CHALLENGE

Manual category results

graph	1	2	3	4	5	6
Wait, it's not cr. max.?	1	3	2	4	2	4
All of a sudden	1	4	2	9	5	23
maximum	1	3	2	8	6	6
DamnYellowEdges	1	2	2	5	3	4
Charlemagne	1	5	2	12	12	40
Brock VGG 1	1	4	2	9	4	14
TUM-UBC	1	4	2	11	6	20
TeaM Velociraptor	1	3	2	4	4	8
Marcus	1	3	4	4	4	8
Agnes Tachyon	1	3	4	6	6	15
timj 9x	1	2	4	4	2	2
Defective team	1	5	4	6	4	12
We eat graphs	1	2	2	6	4	13

LIVE CHALLENGE

Manual category results

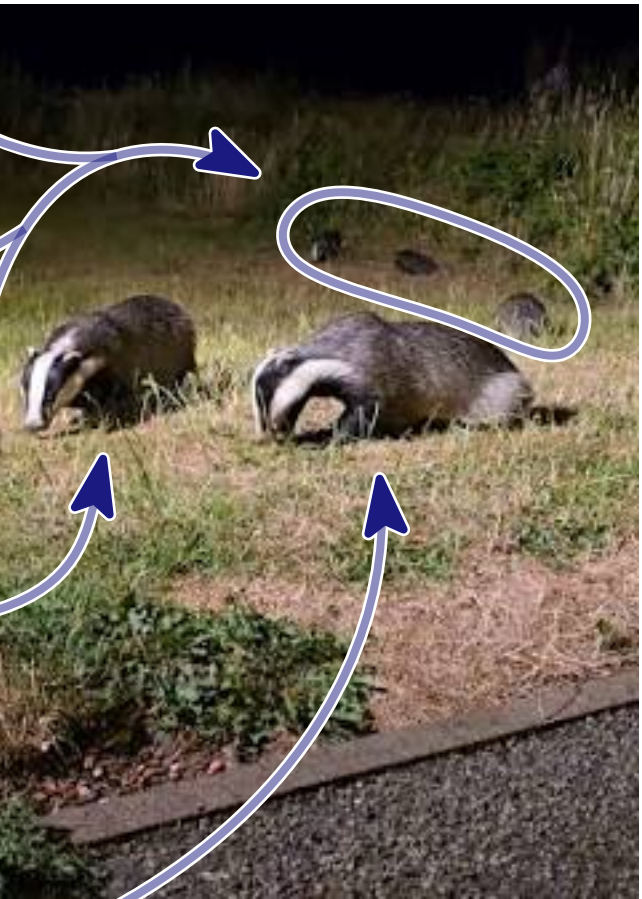
graph	1	2	3	4	5	6
Wait, it's not cr. max.?	1	3	2	4	2	4
All of a sudden	1	4	2	9	5	23
maximum	1	3	2	8	6	6
DamnYellowEdges	1	2	2	5	3	4
Charlemagne	1	5	2	12	12	40
Brock VGG 1	1	4	2	9	4	14
TUM-UBC	1	4	2	11	6	20
TeaM Velociraptor	1	3	2	4	4	9
Marcus	1	3	4	4	4	8
Agnes Tachyon	1	3	4	6	6	15
timj 9x	1	2	4	4	2	2
Defective team	1	5	4	6	4	12
We eat graphs	1	2	2	6	4	13



LIVE CHALLENGE

Manual category results

graph	1	2	3	4	5	6
Wait, it's not cr. max.?	1	3	2	4	2	4
All of a sudden	1	4	2	9	5	23
maximum	1	3	2	8	6	6
DamnYellowEdges	1	2	2	5	3	4
Charlemagne	1	5	2	12	12	40
Brock VGG 1	1	4	2	9	4	14
TUM-UBC	1	4	2	11	6	20
TeaM Velociraptor	1	3	2	4	4	9
Marcus	1	3	4	4	4	8
Agnes Tachyon	1	3	4	6	6	15
timj 9x	1	2	4	4	2	2
Defective team	1	5	4	6	4	12
We eat graphs	1	2	2	6	4	13



LIVE CHALLENGE

Manual category results

graph	1	2	3	4	5	6	7
Wait, it's not cr. max.?	1	3	2	4	2	4	3
All of a sudden	1	4	2	9	5	23	3
maximum	1	3	2	8	6	6	4
DamnYellowEdges	1	2	2	5	3	4	3
Charlemagne	1	5	2	12	12	40	5
Brock VGG 1	1	4	2	9	4	14	5
TUM-UBC	1	4	2	11	6	20	5
TeaM Velociraptor	1	3	2	4	4	8	5
Marcus	1	3	4	4	4	8	4
Agnes Tachyon	1	3	4	6	6	15	4
timj 9x	1	2	4	4	2	2	3
Defective team	1	5	4	6	4	12	5
We eat graphs	1	2	2	6	4	13	4

LIVE CHALLENGE

Manual category results

graph	1	2	3	4	5	6	7
Wait, it's not cr. max.?	1	3	2	4	2	4	3
All of a sudden	1	4	2	9	5	23	3
maximum	1	3	2	8	6	6	4
DamnYellowEdges	1	2	2	5	3	4	3
Charlemagne	1	5	2	12	12	40	5
Brock VGG 1	1	1	2	0	1	14	5
Thomas Depian, Matthias Pfretzschner, & Joseph Dorfer							26
DamnYellowEdges							8
Agnes Tachyon	1	3	4	0	0	15	4
timj 9x	1	2	4	4	2	2	3
Defective team	1	5	4	6	4	12	5
We eat graphs	1	2	2	6	4	13	4



LIVE CHALLENGE

Manual category results

graph	1	2	3	4	5	6	7
Wait, it's not cr. max.?	1	3	2	4	2	4	3
All of a sudden	1	4	2	9	5	23	3
 Dominik Jilg, Marcel Nöhre, & Samuel Wolf <i>Wait, it's not crossing maximization?</i>						6	
TUM-UBC	1	4	2	11	6	20	5
TeaM Velociraptor	1	3	2	4	4	8	5
Marcus	1	3	4	4	4	8	4
Agnes Tachyon	1	3	4	6	6	15	4
timj 9x	1	2	4	4	2	2	3
Defective team	1	5	4	6	4	12	5
We eat graphs	1	2	2	6	4	13	4



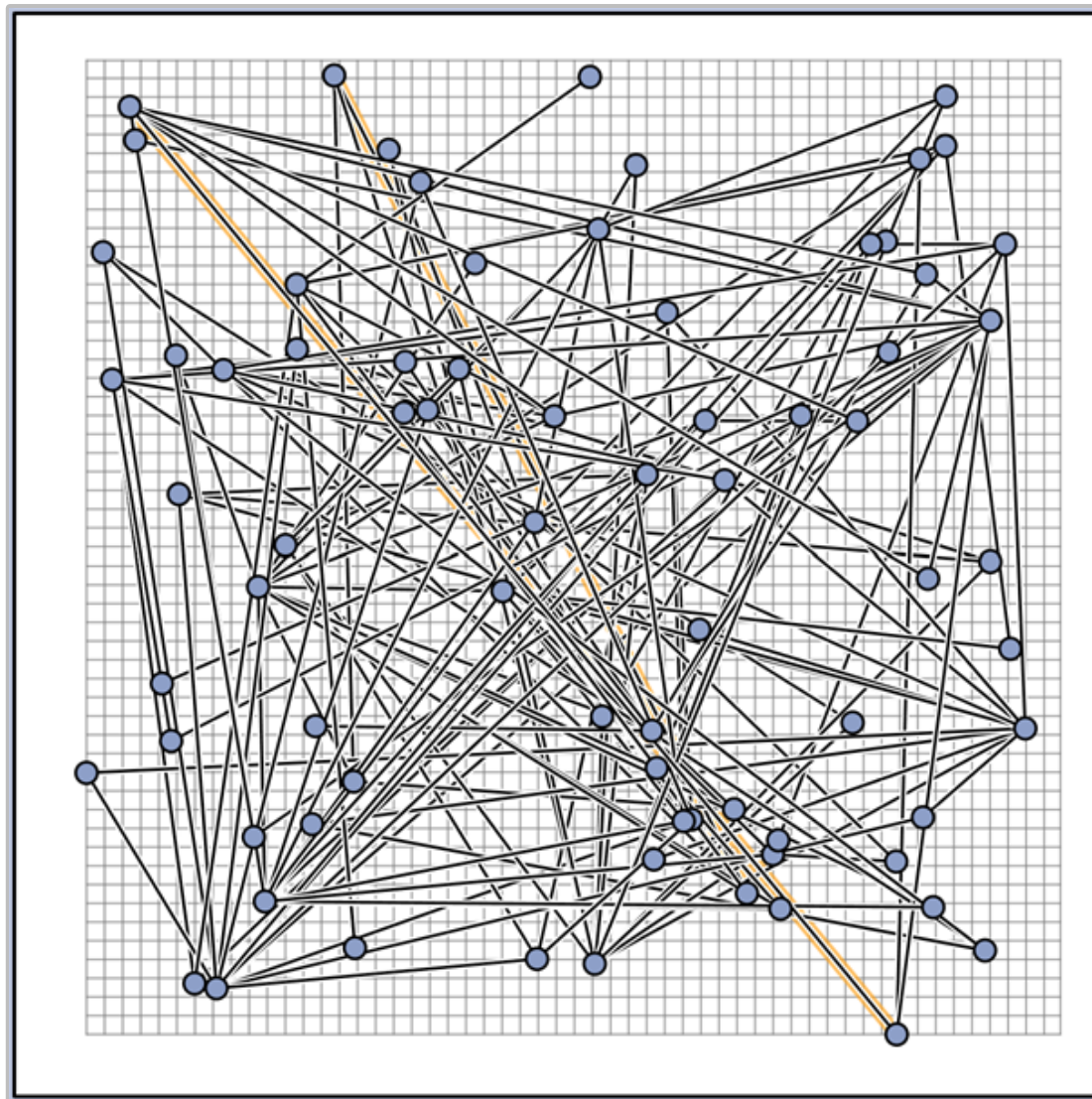
LIVE CHALLENGE

Manual category results

graph	1	2	3	4	5	6	7
Wait, it's not cr. max.?	1	3	2	4	2	4	3
All of a sudden	1	4	2	9	5	23	3
maximum	1	3	2	8	6	6	4
DamnYellowEdges	1	2	2	5	3	4	3
Charlemagne	1	5	2	12	12	40	5
Timo Brand, Mirko H. Wagner, & Johannes Zink timj 9x 							
Agnes Tachyon	1	3	4	6	6	15	4
timj 9x	1	2	4	4	2	2	3
Defective team	1	5	4	6	4	12	5
We eat graphs	1	2	2	6	4	13	4

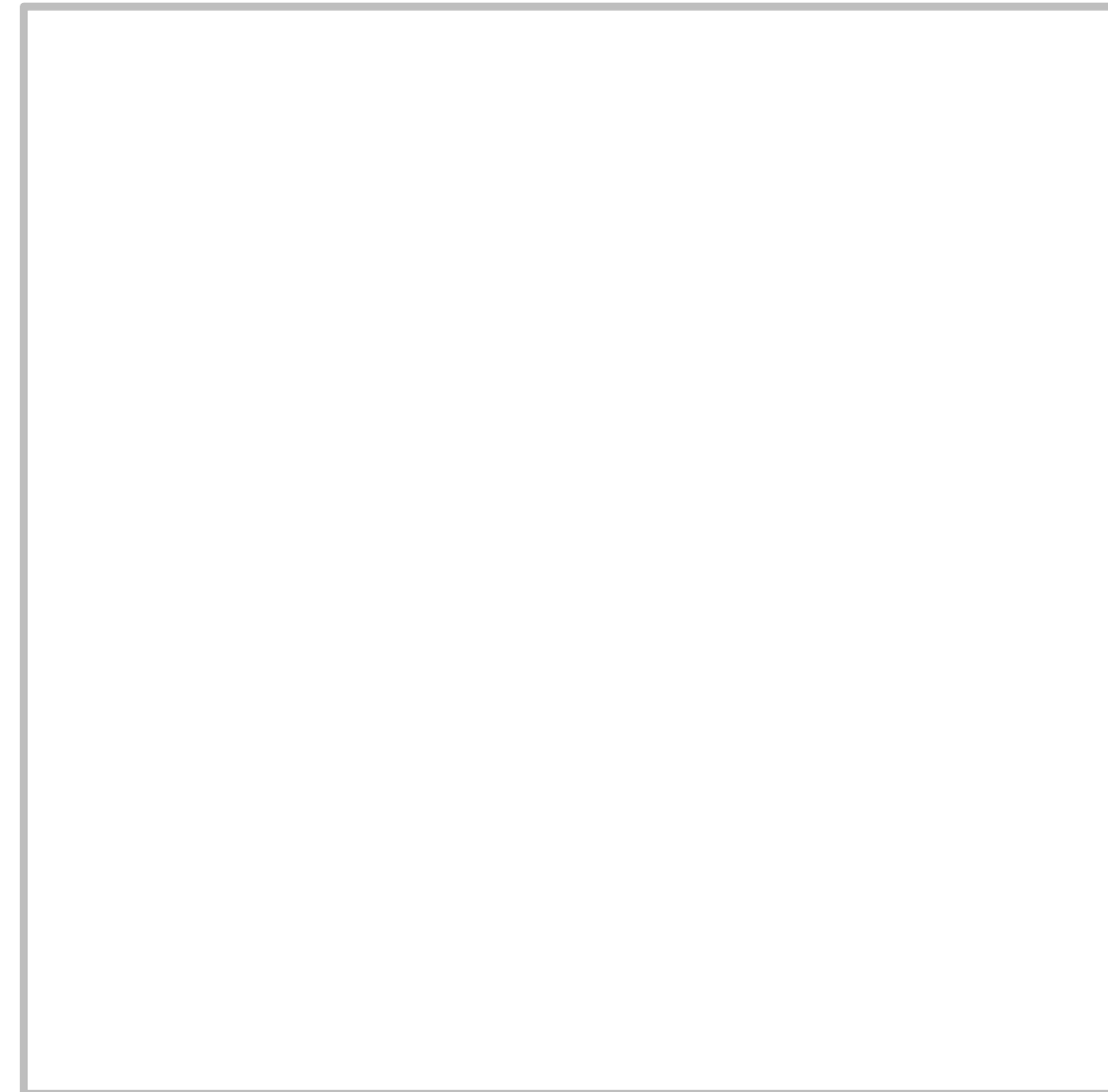
LIVE CHALLENGE

Automatic category graphs



input
84-planar

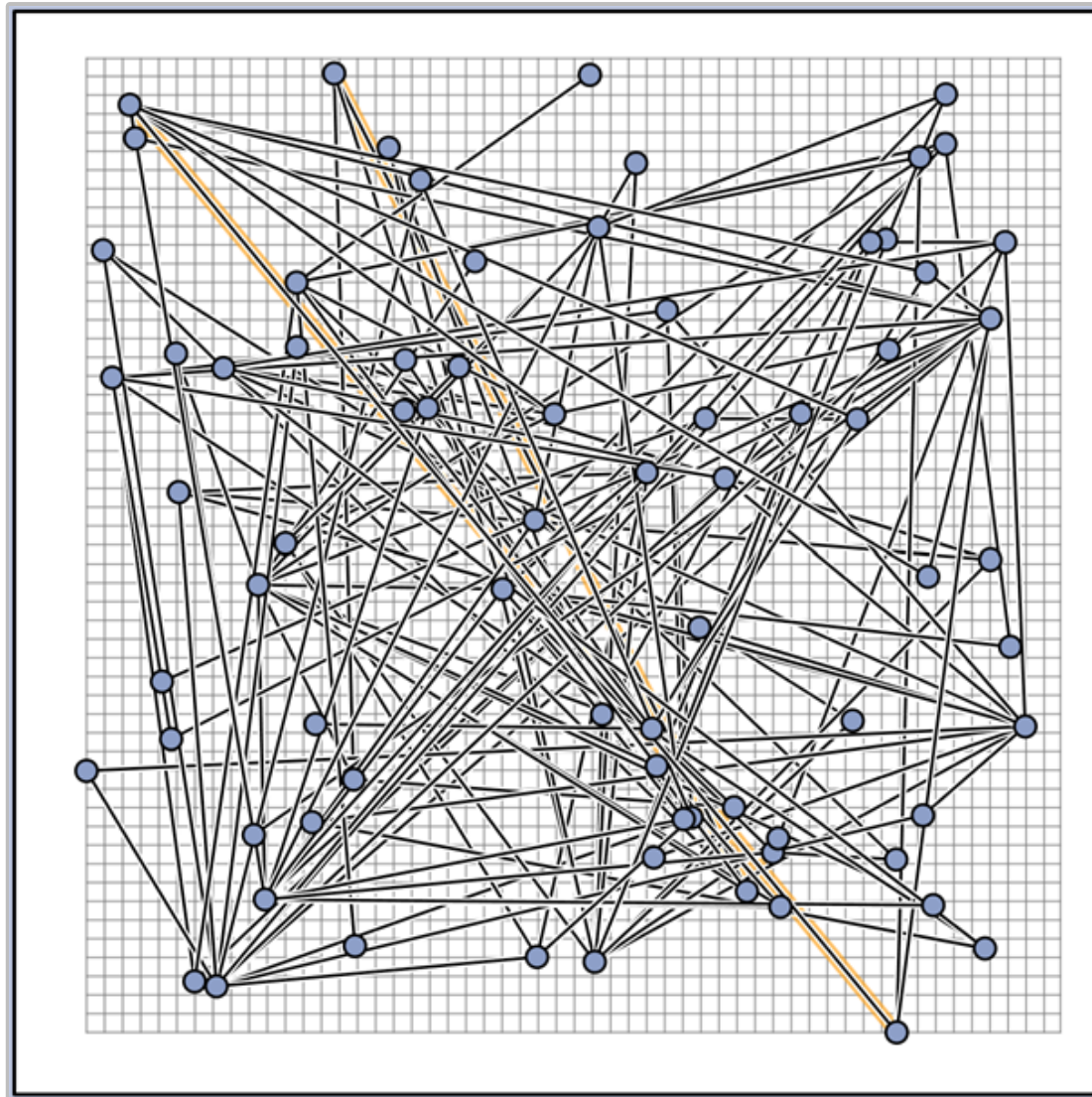
graph 8



best automatic

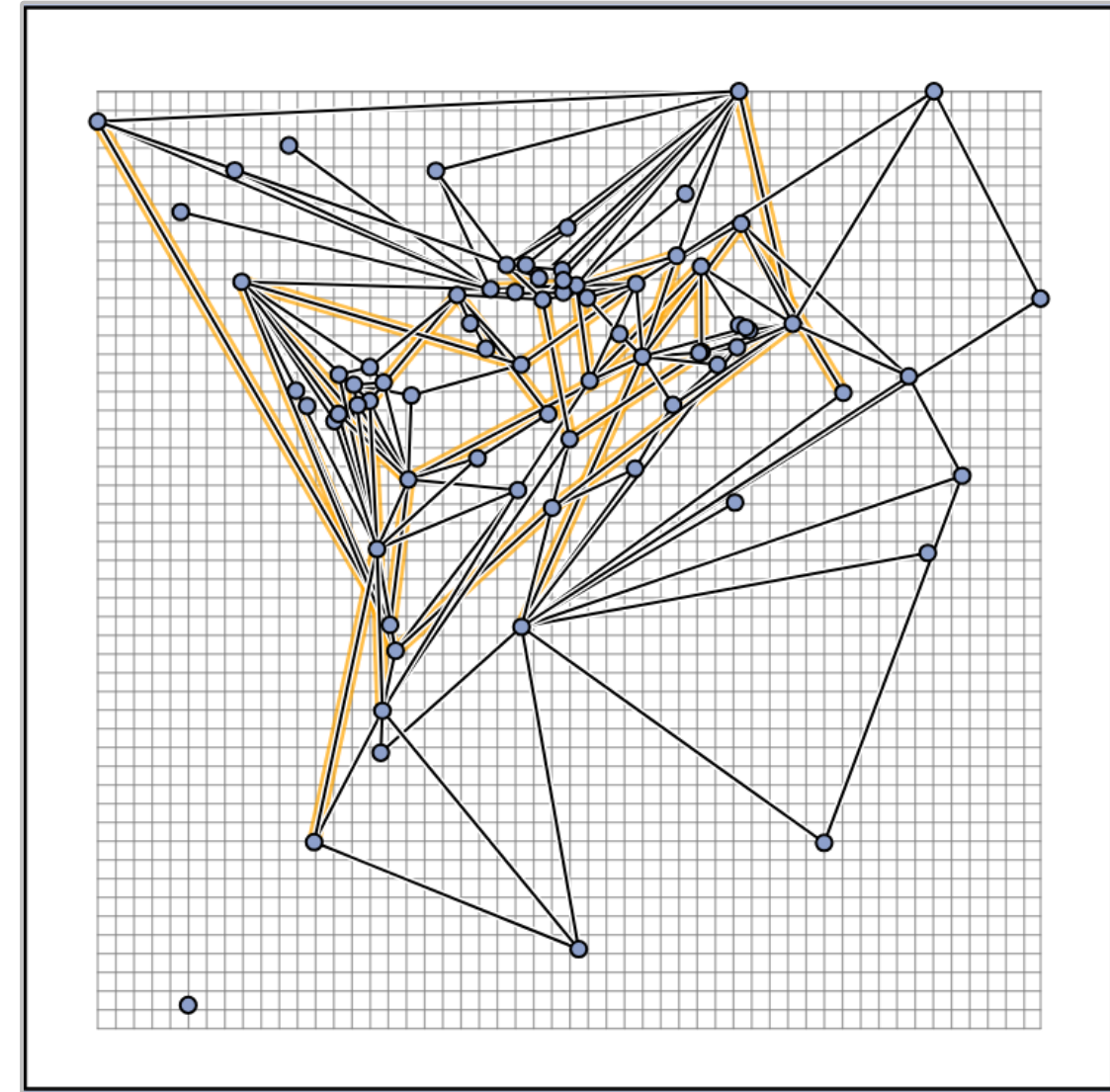
LIVE CHALLENGE

Automatic category graphs



input
84-planar

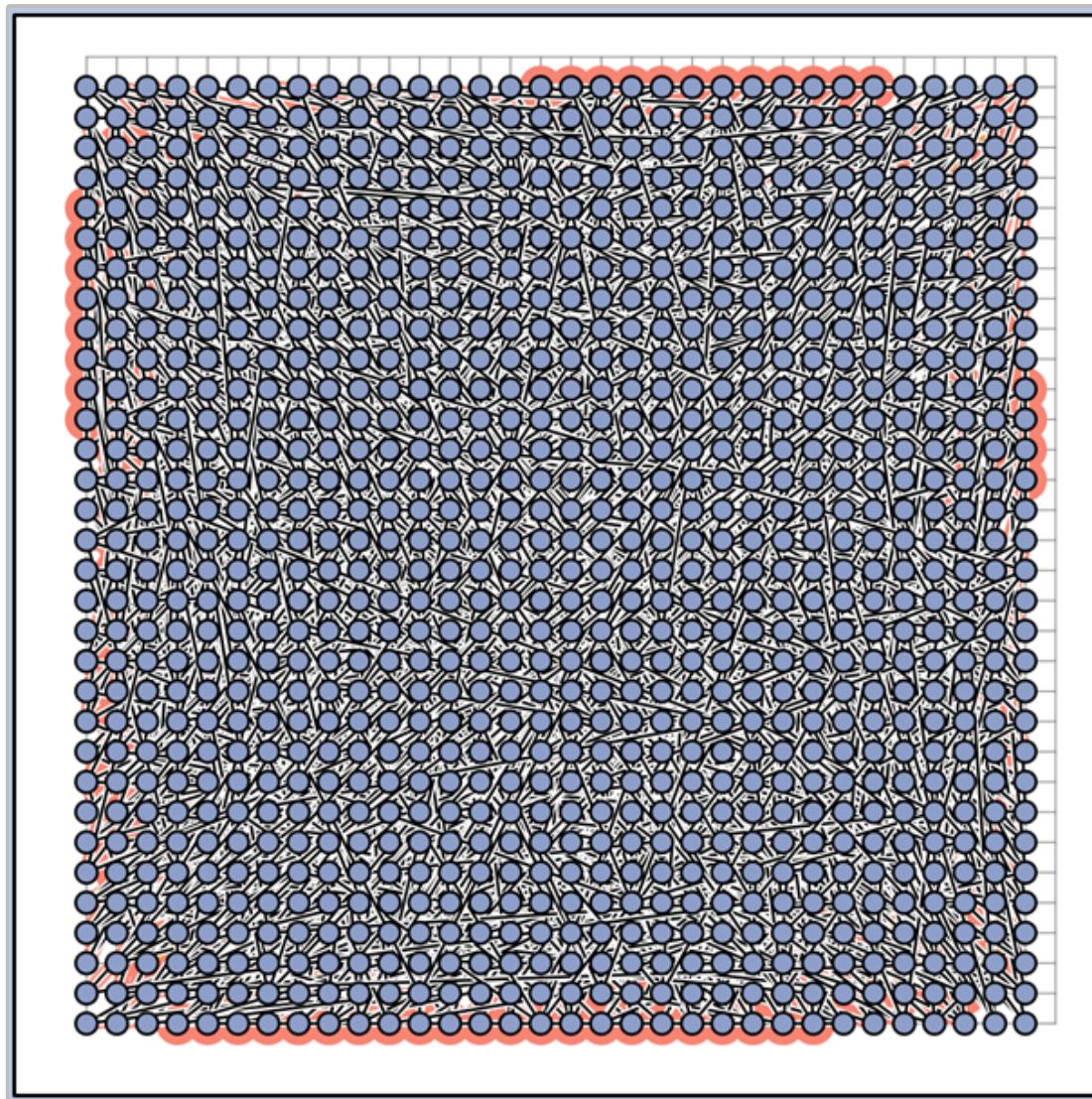
graph 8



best automatic
CTRL+ALT+RESERVE
3-planar

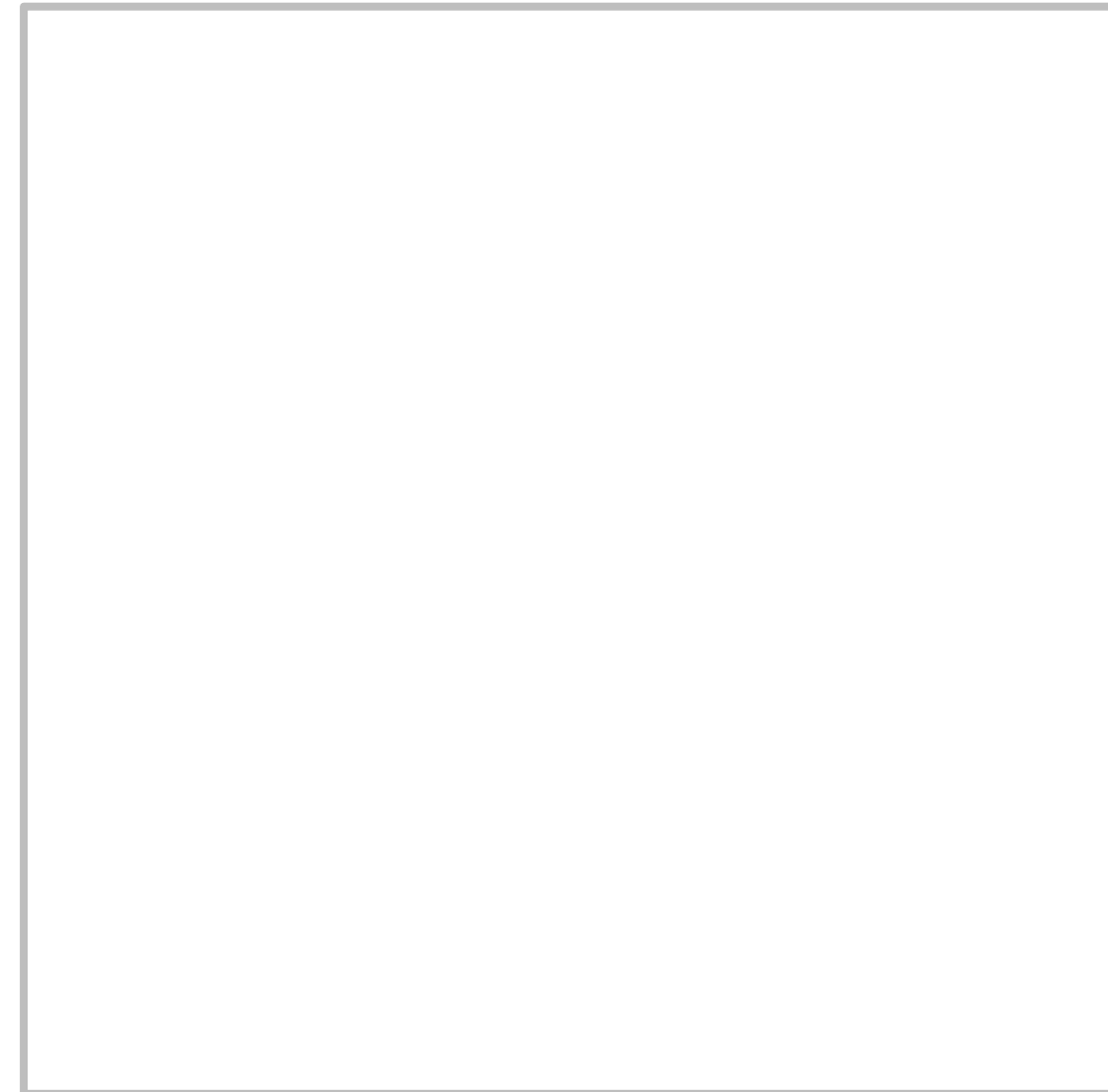
LIVE CHALLENGE

Automatic category graphs



input
1049-planar

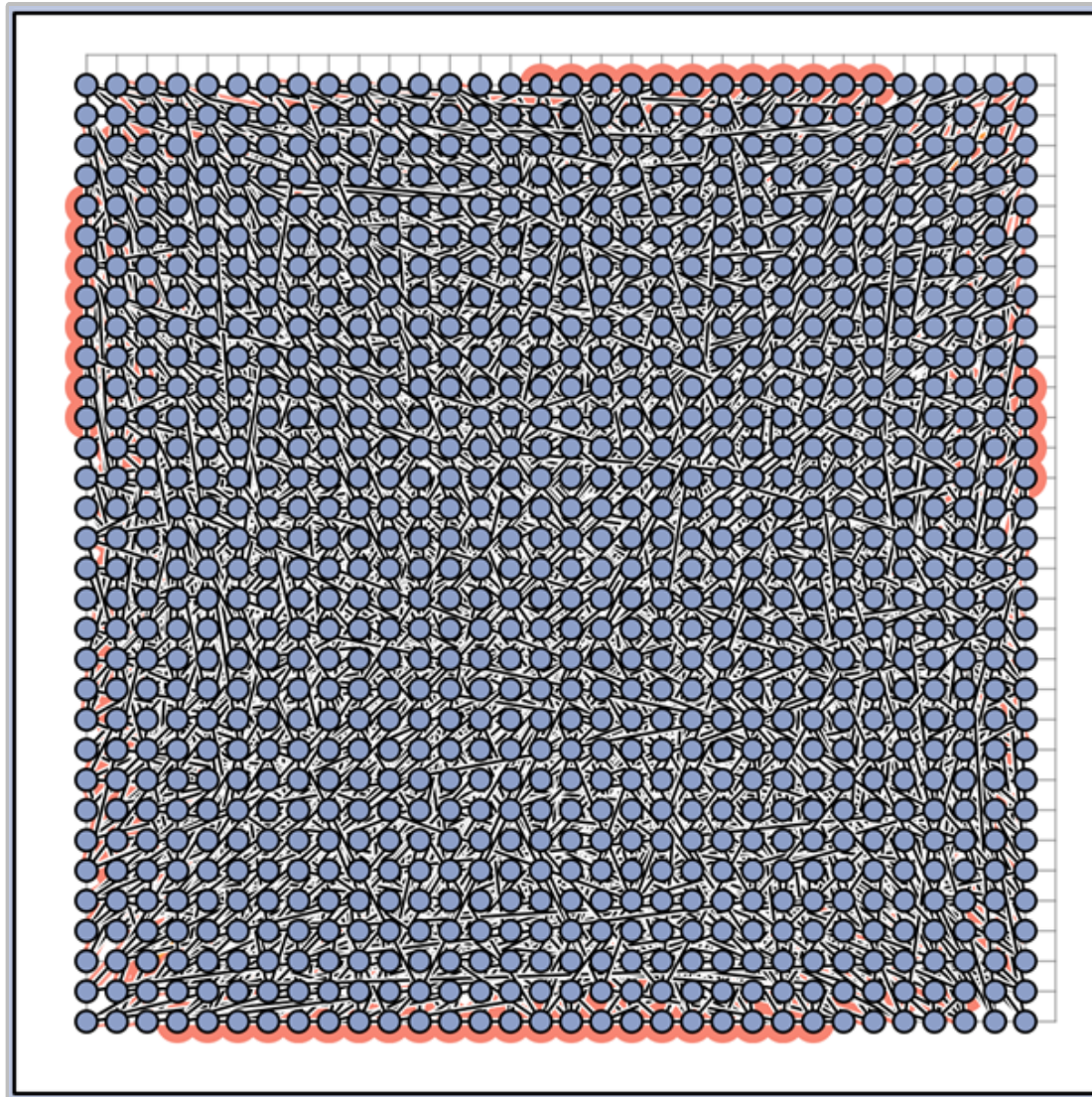
graph **9**



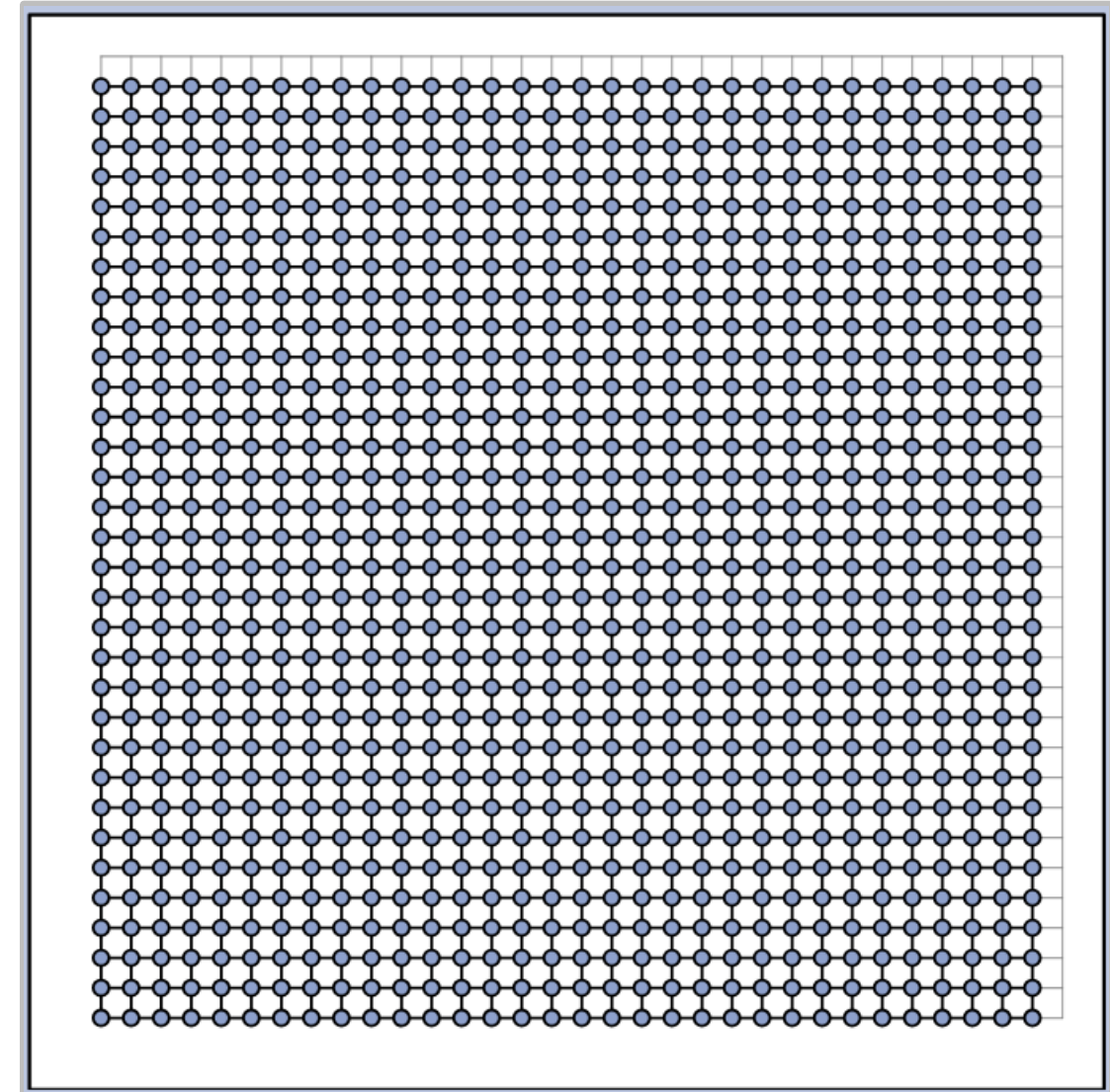
best automatic

LIVE CHALLENGE

Automatic category graphs



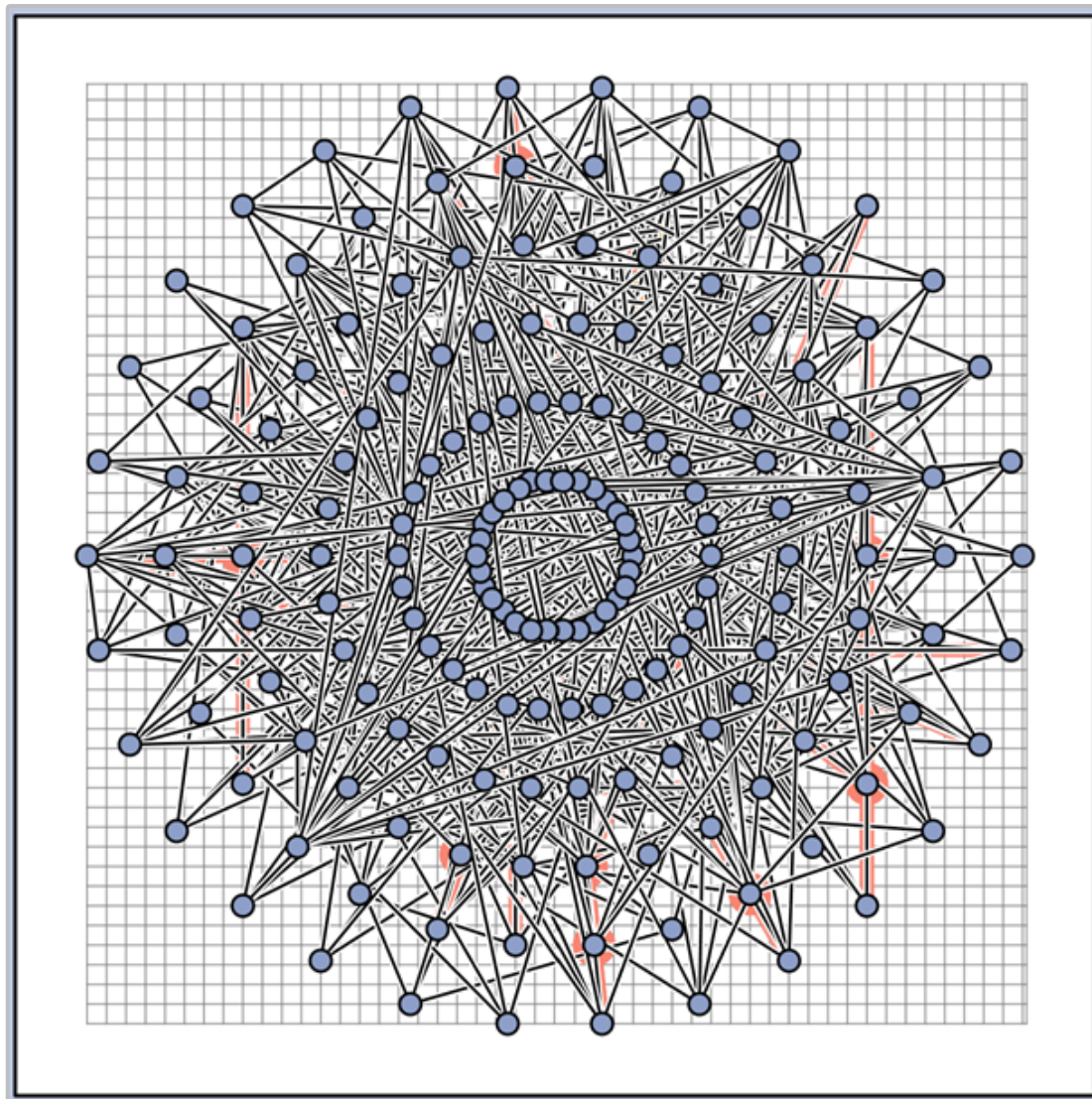
input
1049-planar
graph **9**



best automatic
1-planar
planar

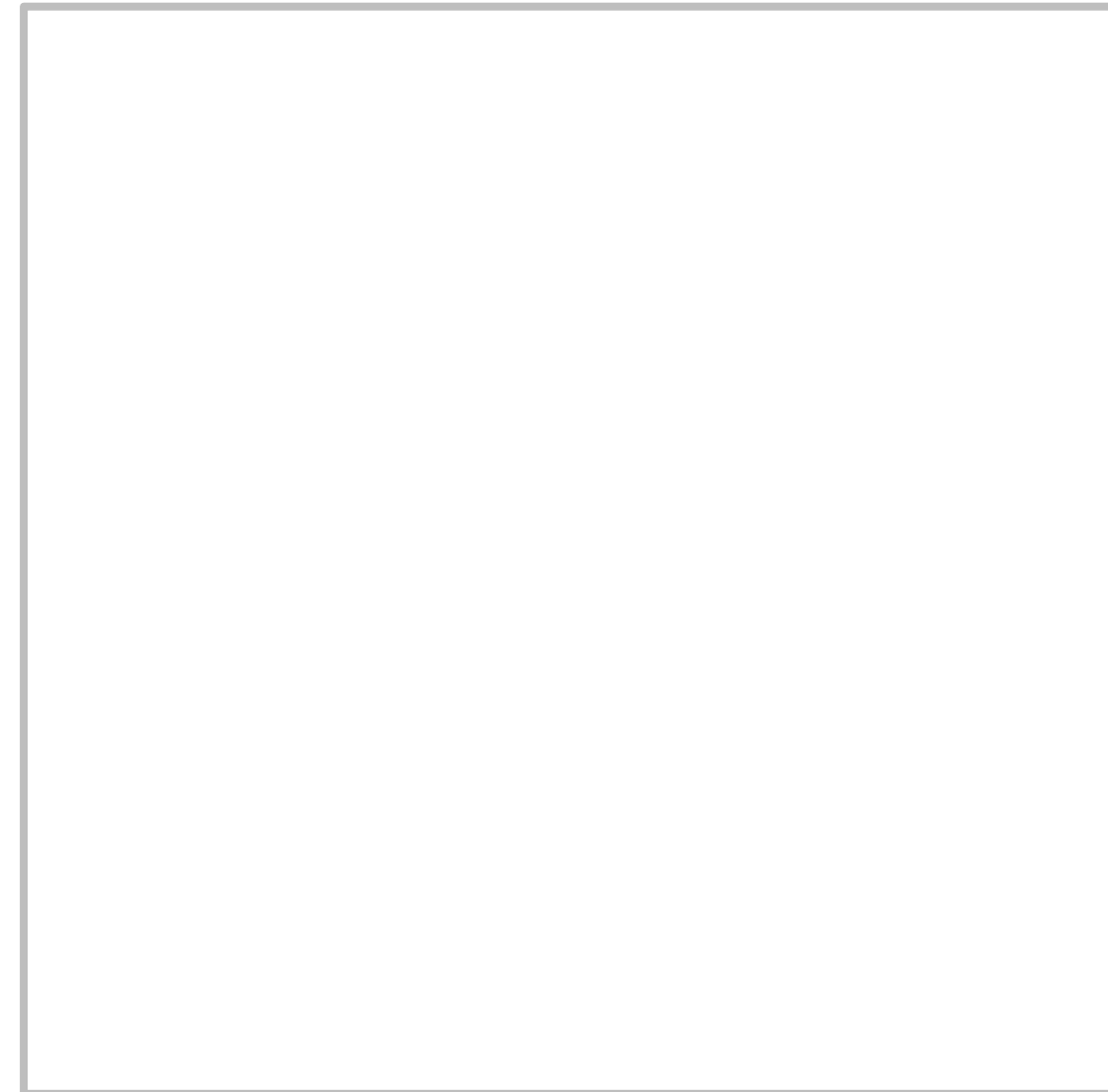
LIVE CHALLENGE

Automatic category graphs



input
375-planar

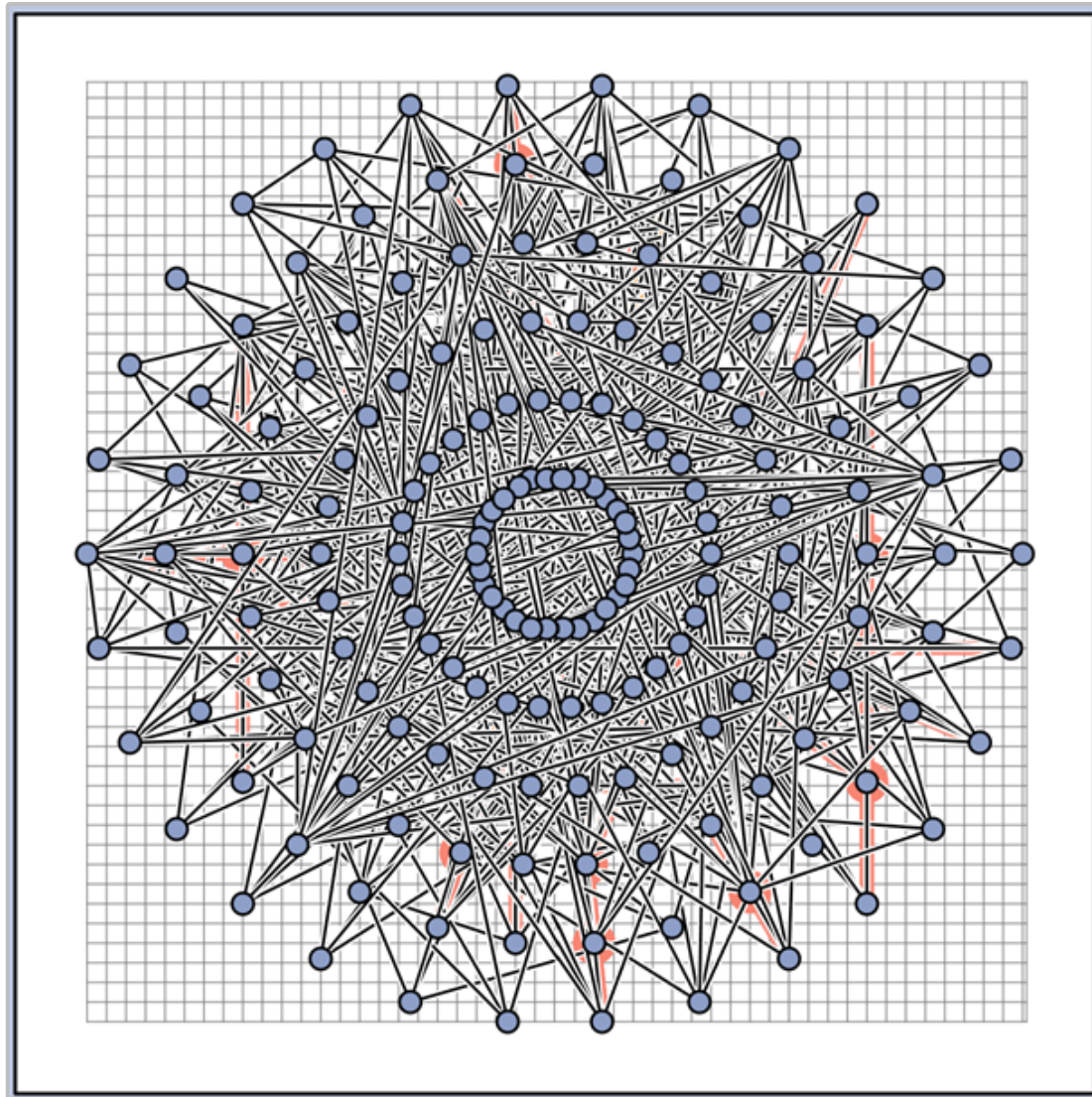
graph **10**



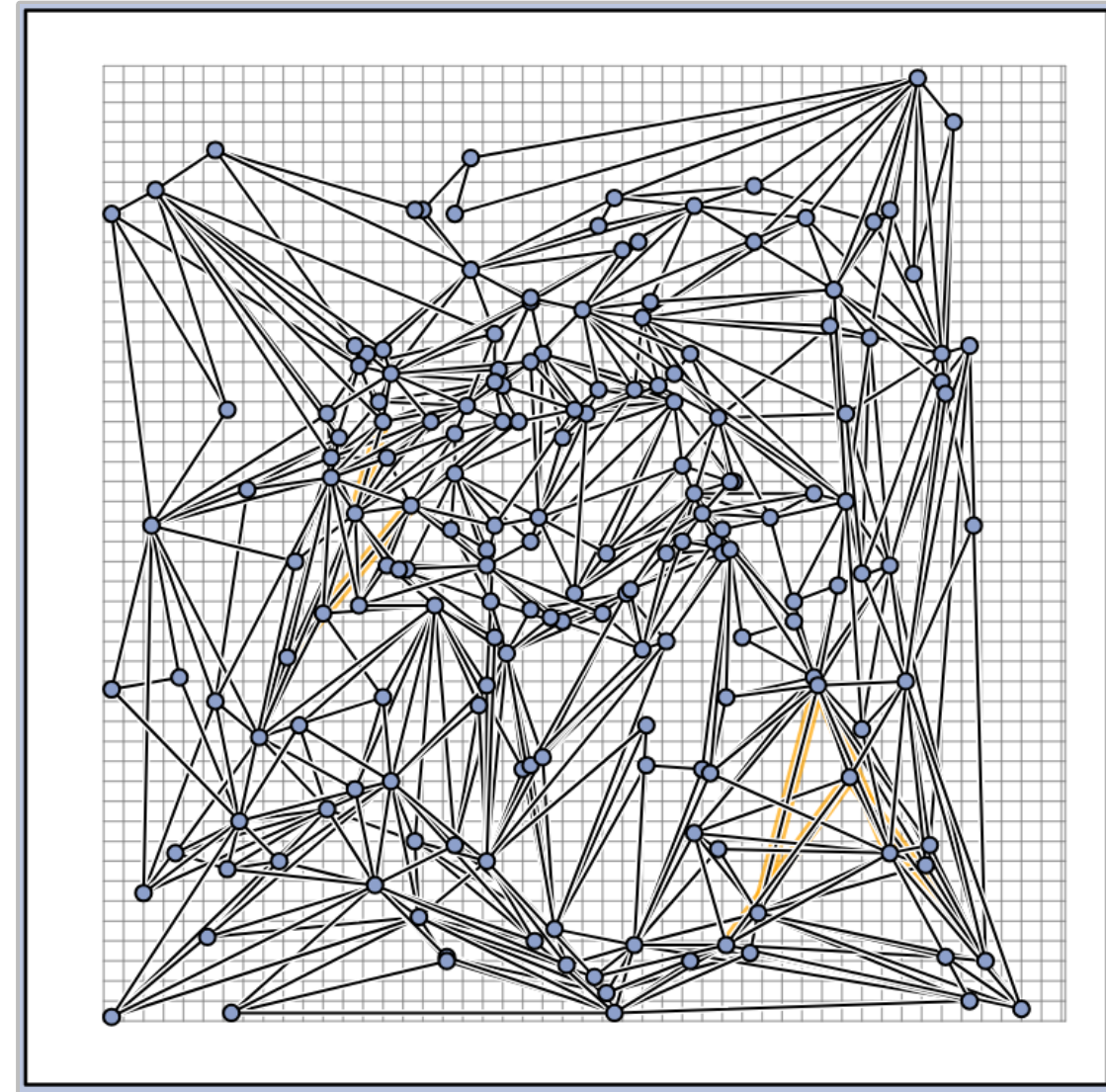
best automatic

LIVE CHALLENGE

Automatic category graphs



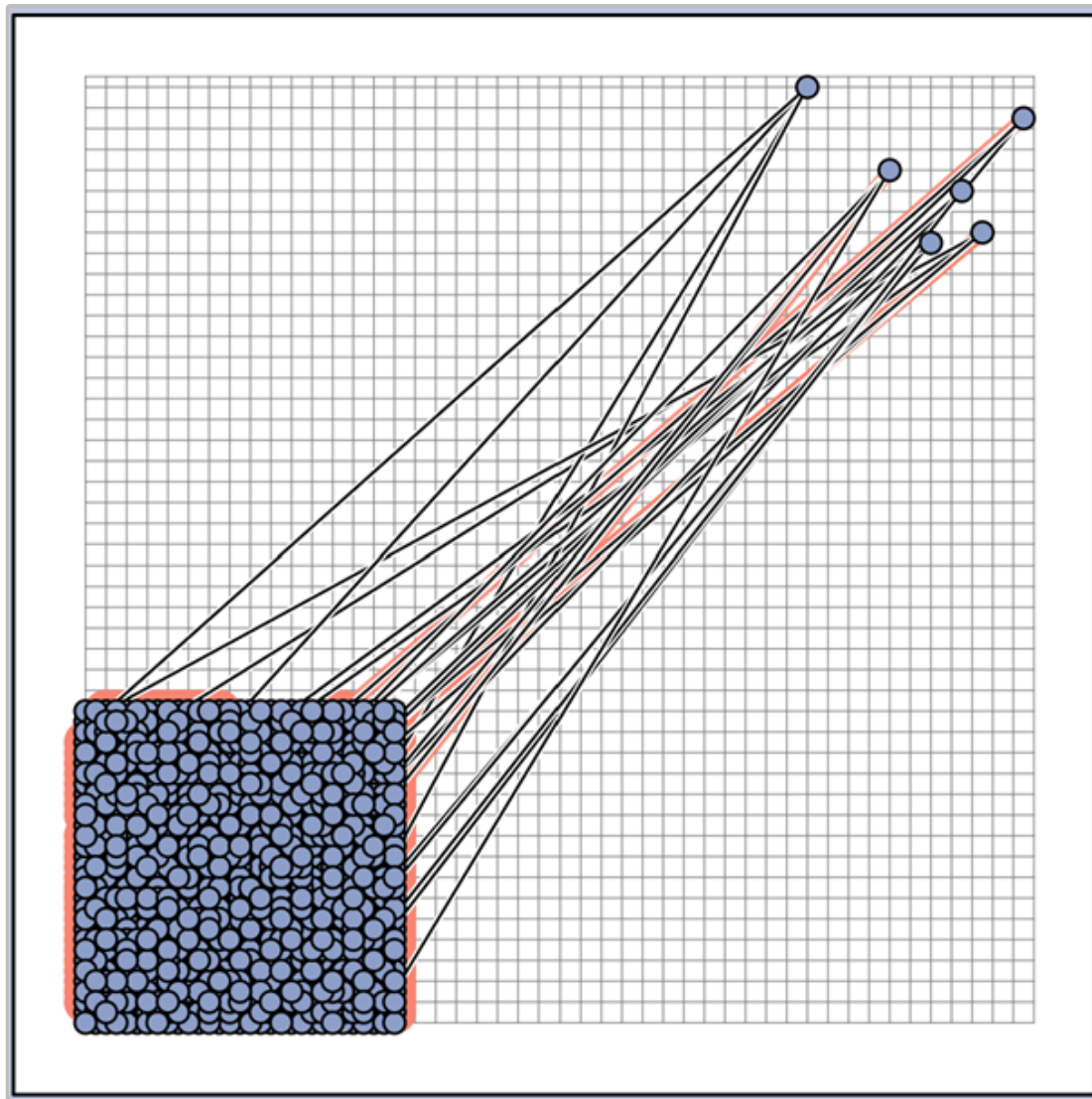
input
375-planar
graph **10**



best automatic
Stress Tested
7-planar

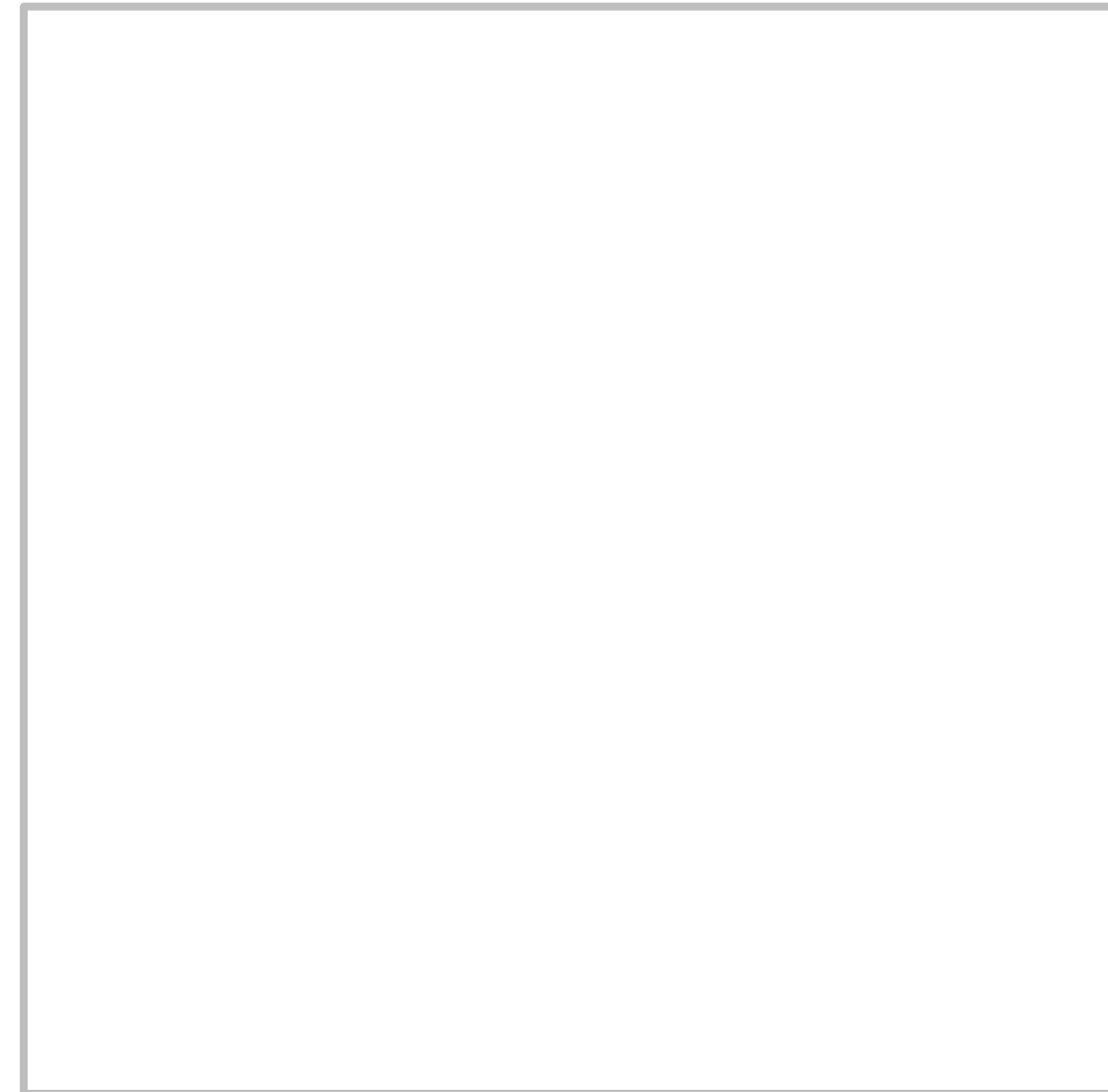
LIVE CHALLENGE

Automatic category graphs



input
984-planar

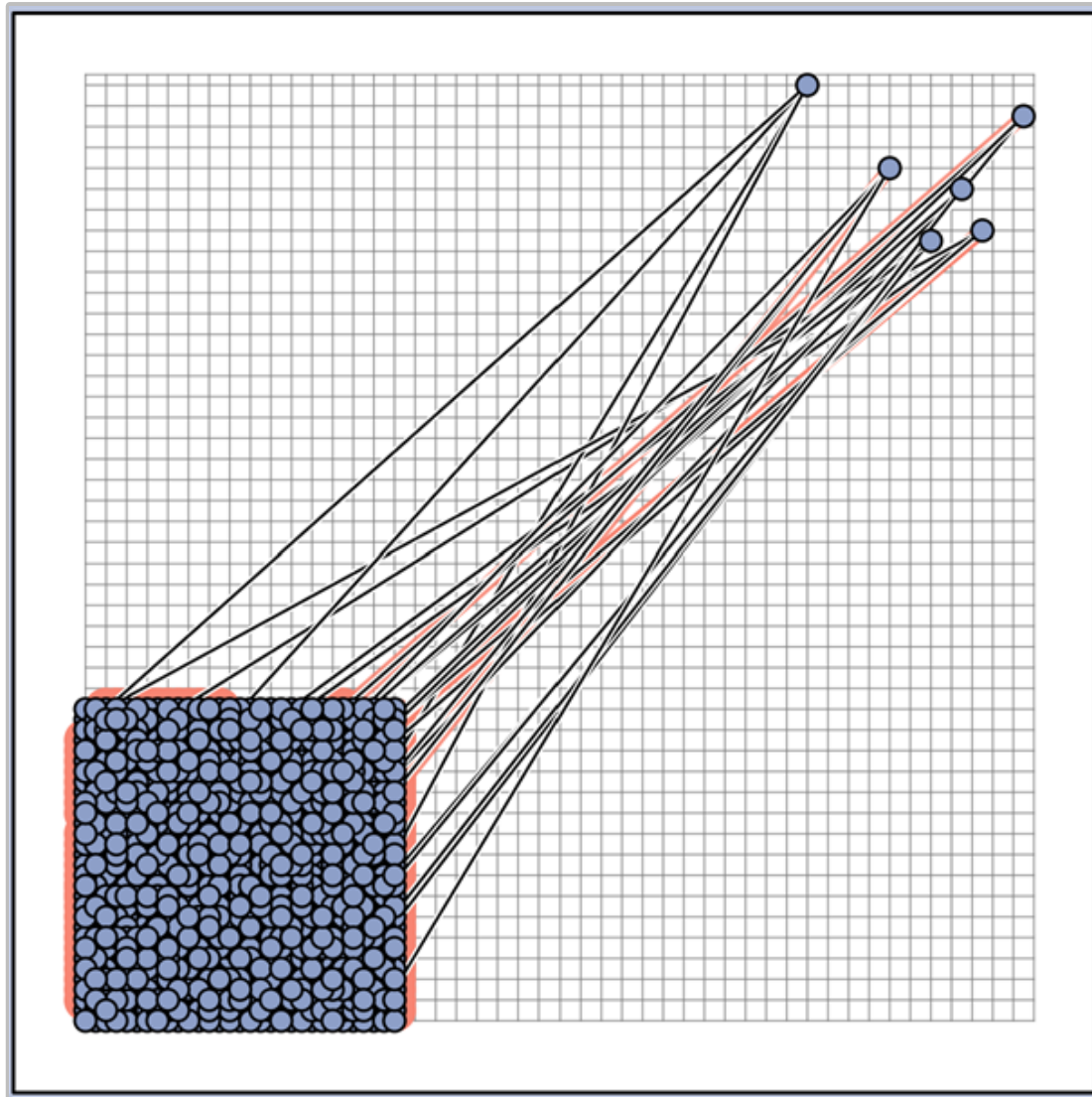
graph **11**



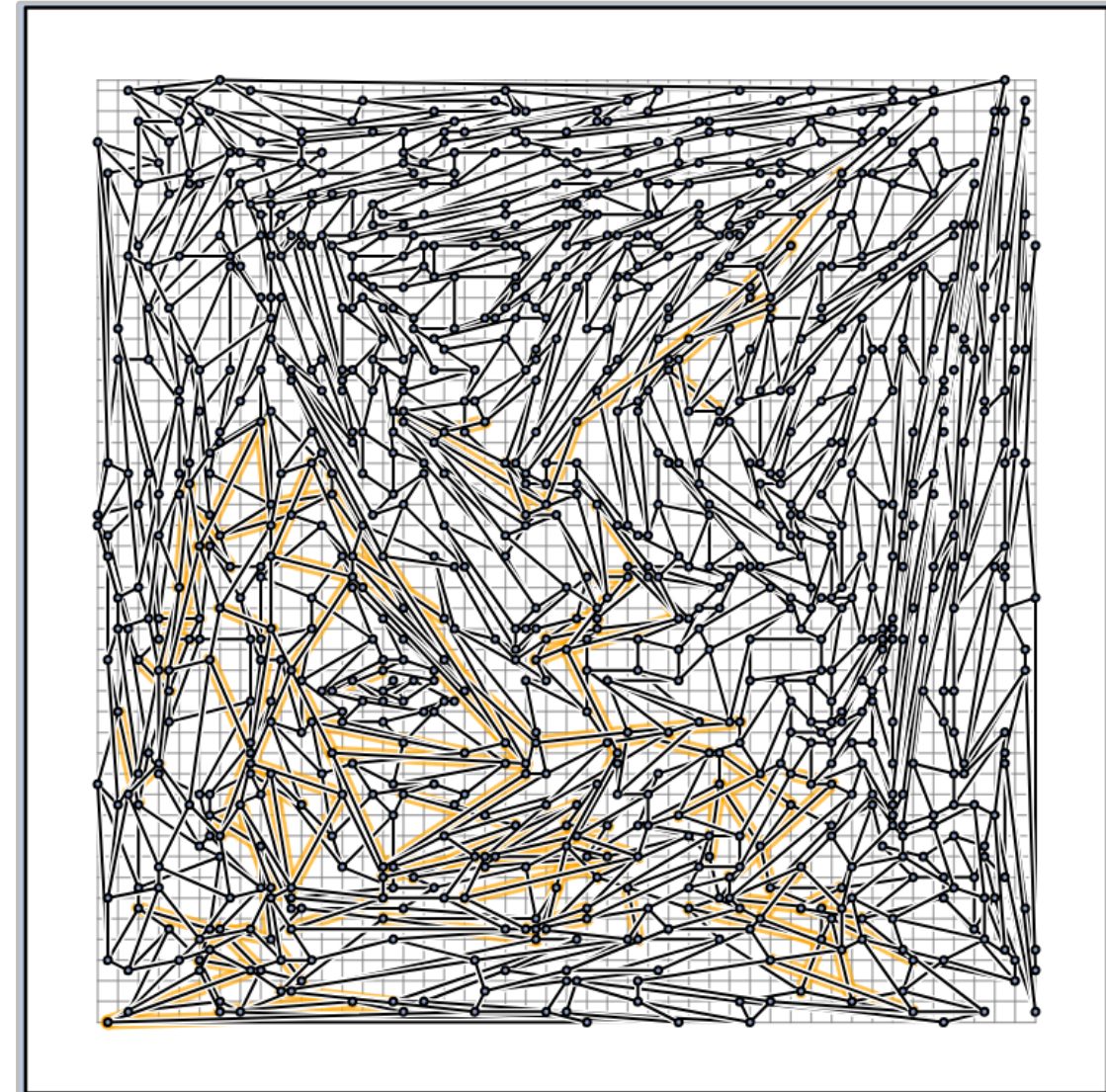
best automatic

LIVE CHALLENGE

Automatic category graphs



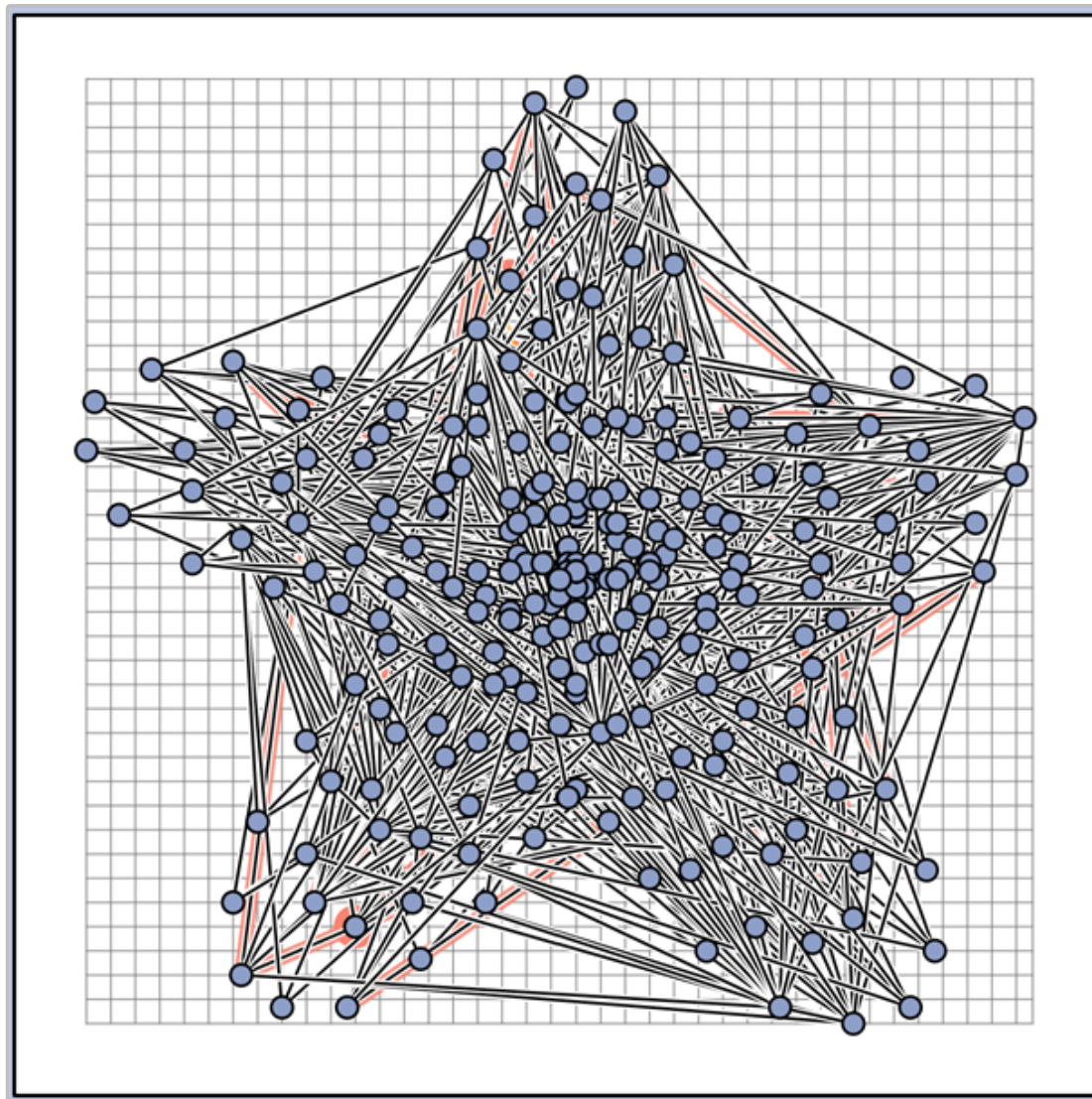
input
984-planar
graph **11**



best automatic
1-planar
3-planar

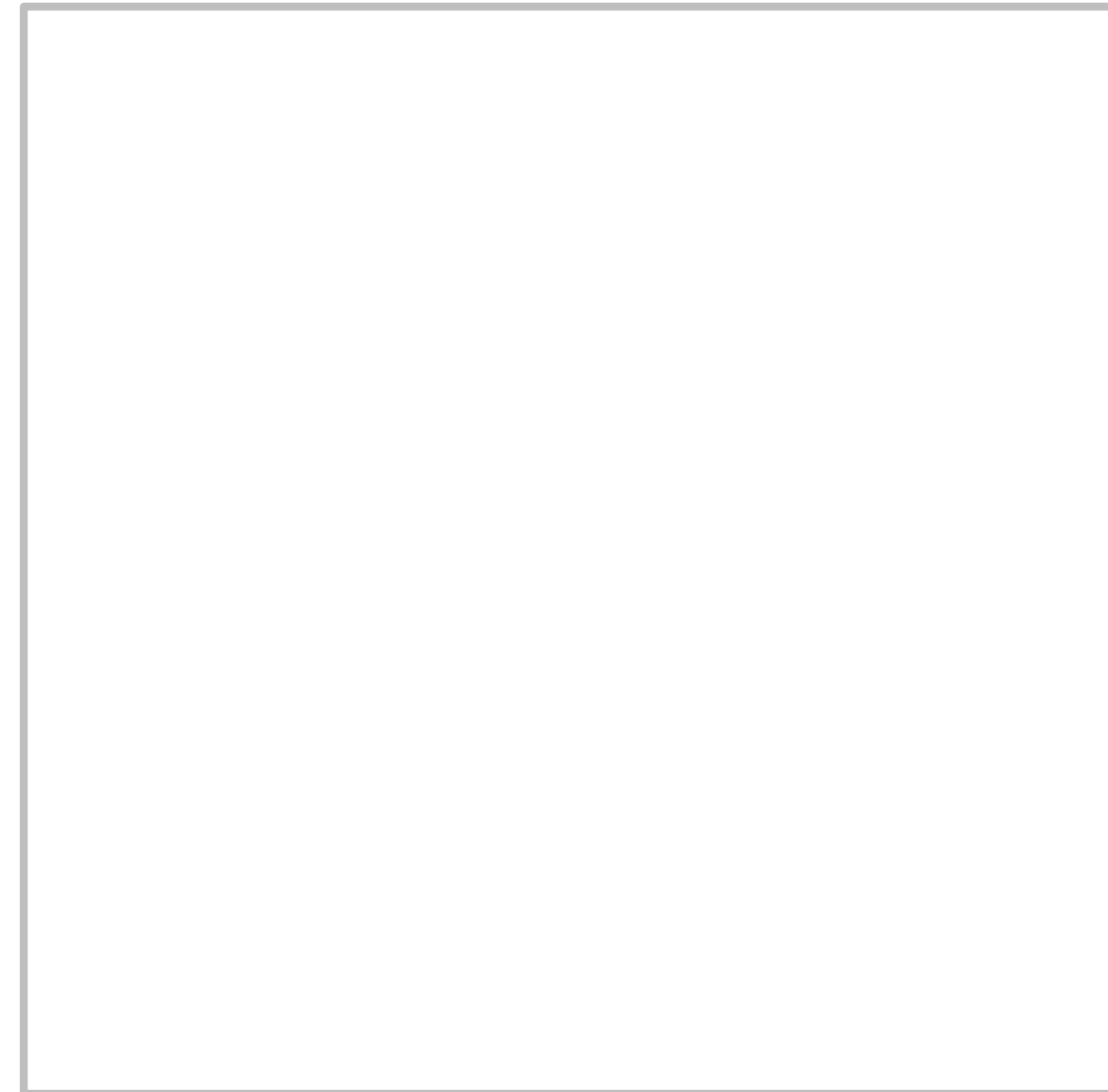
LIVE CHALLENGE

Automatic category graphs



input
611-planar

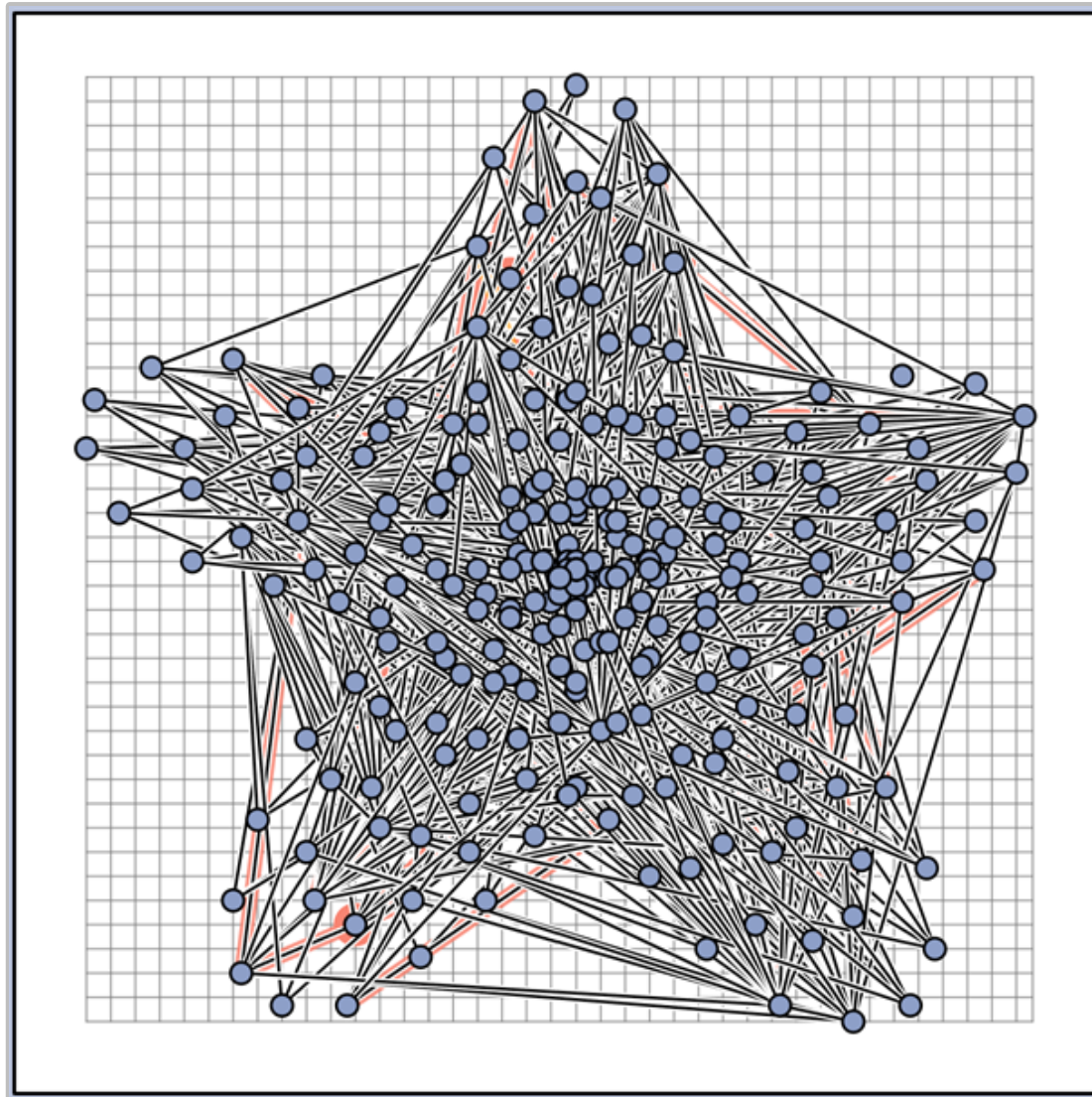
graph **12**



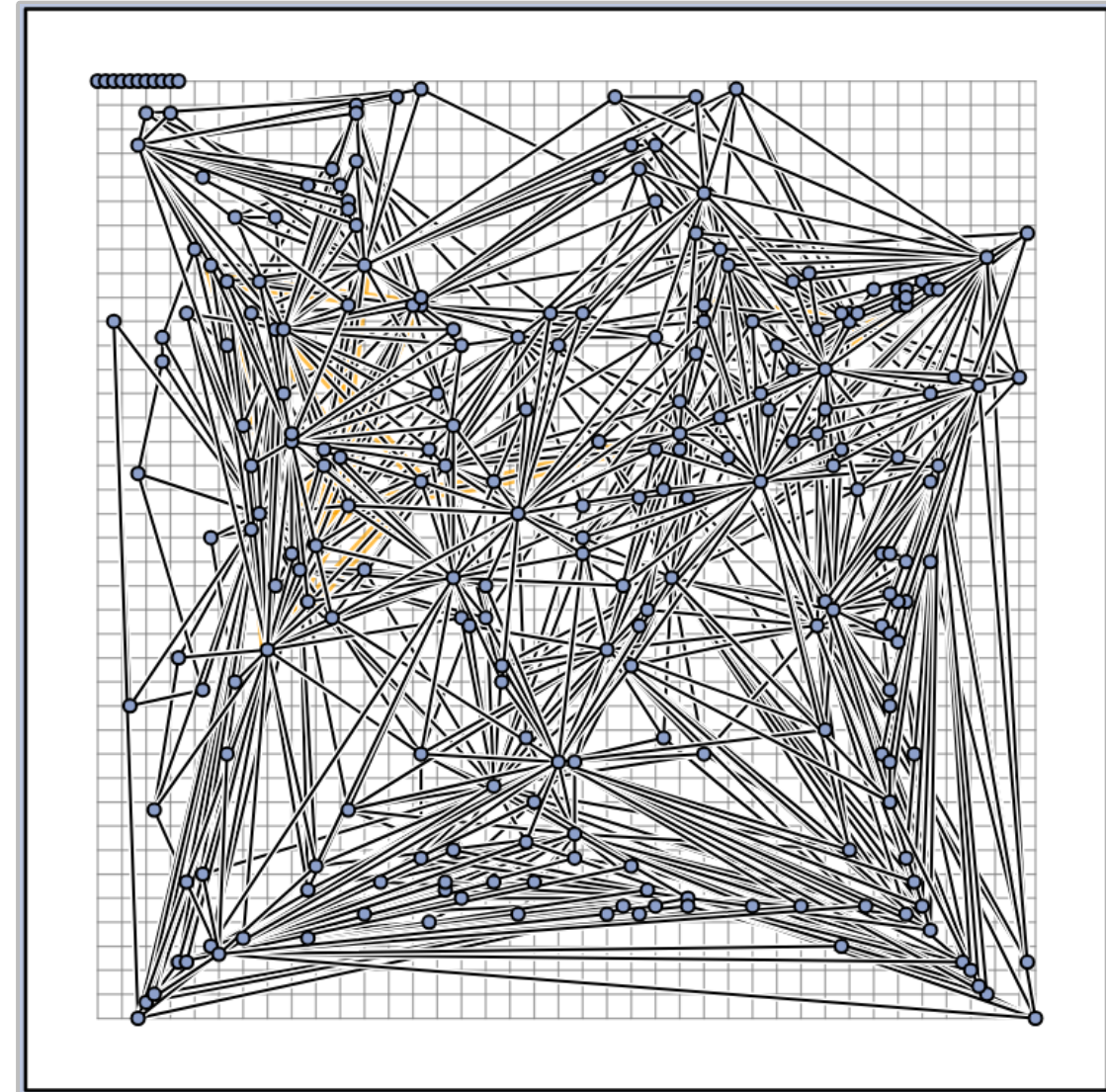
best automatic

LIVE CHALLENGE

Automatic category graphs



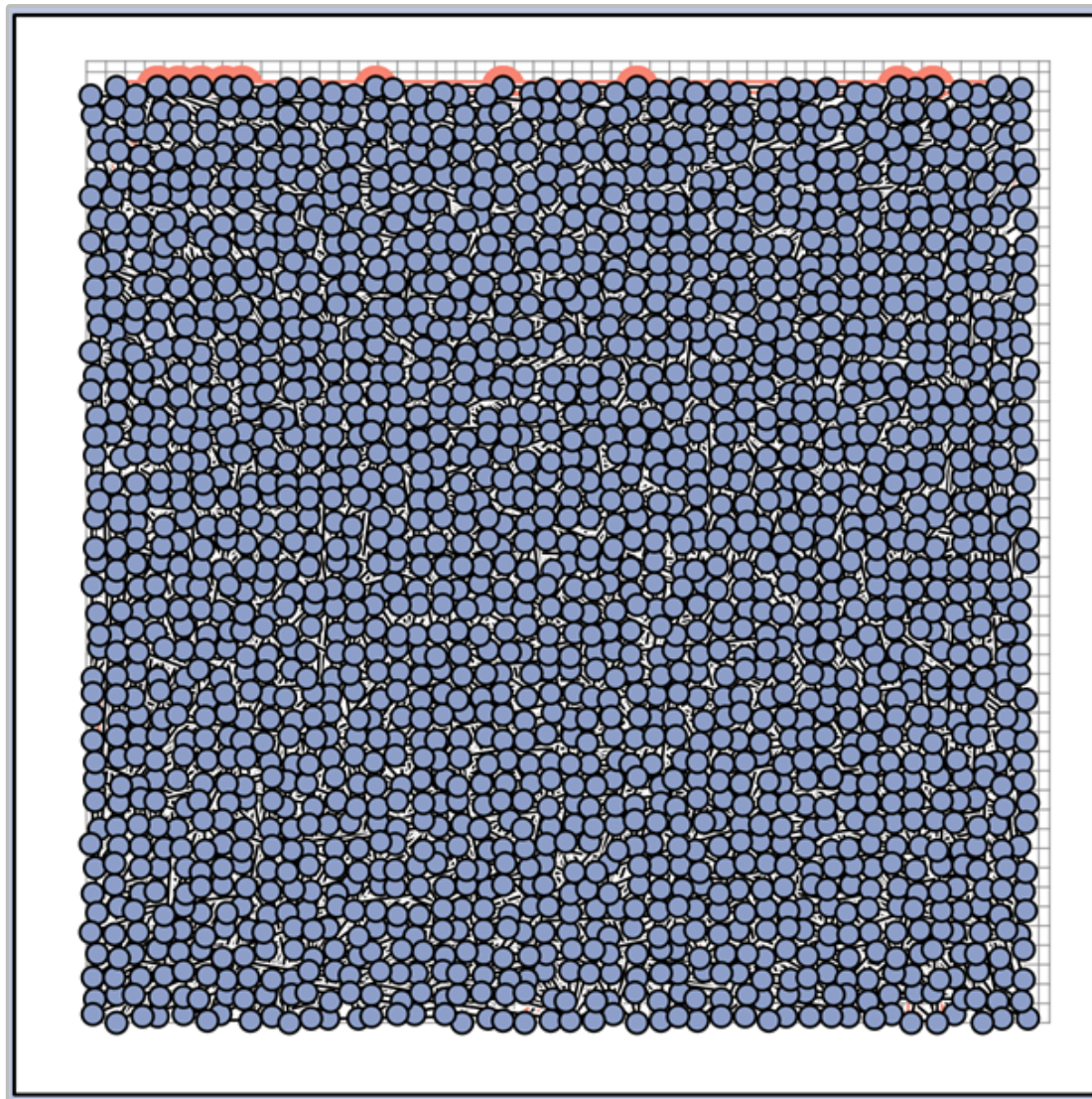
input
611-planar
graph **12**



best automatic
1-planar
28-planar

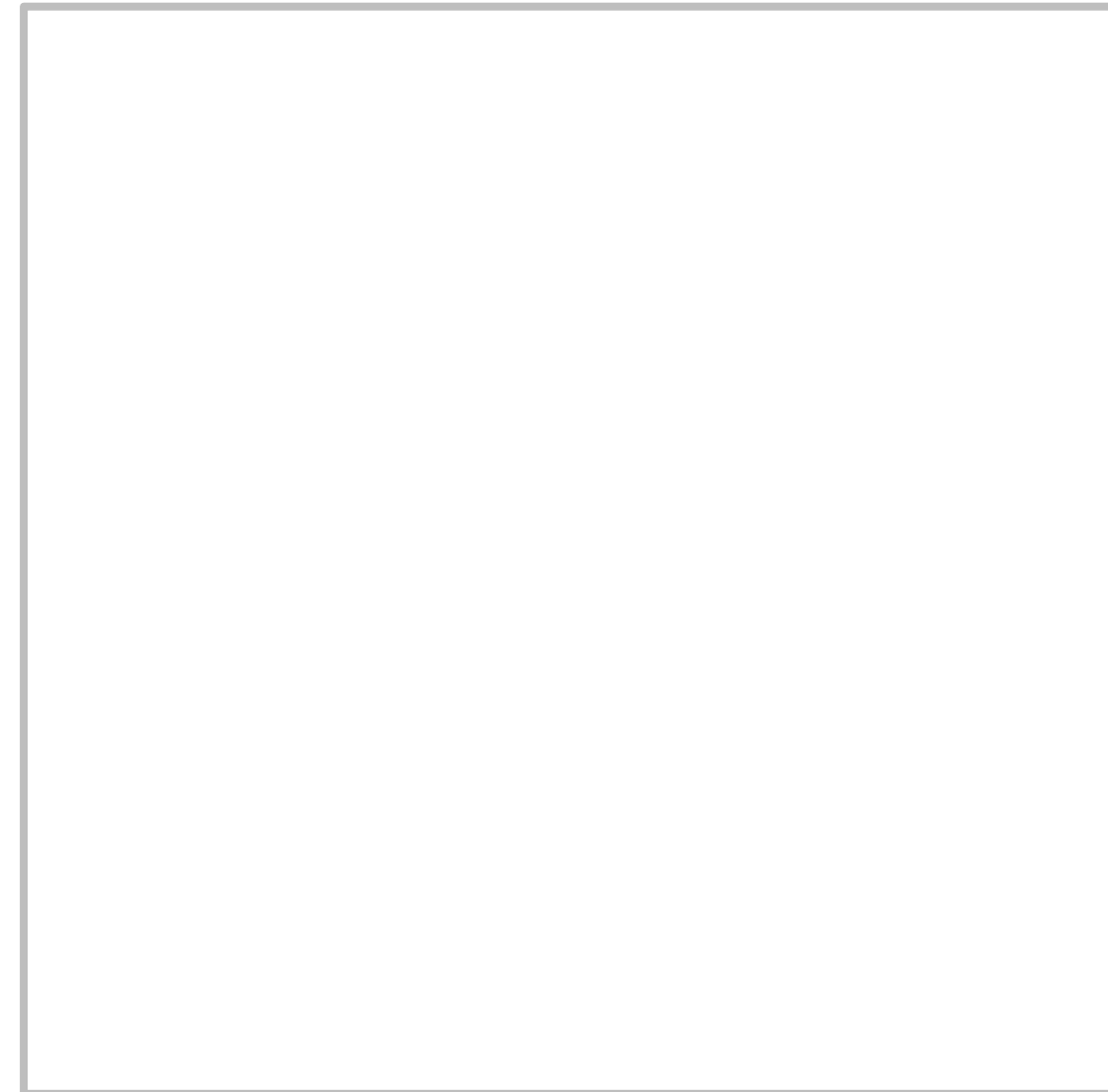
LIVE CHALLENGE

Automatic category graphs



input
1776-planar

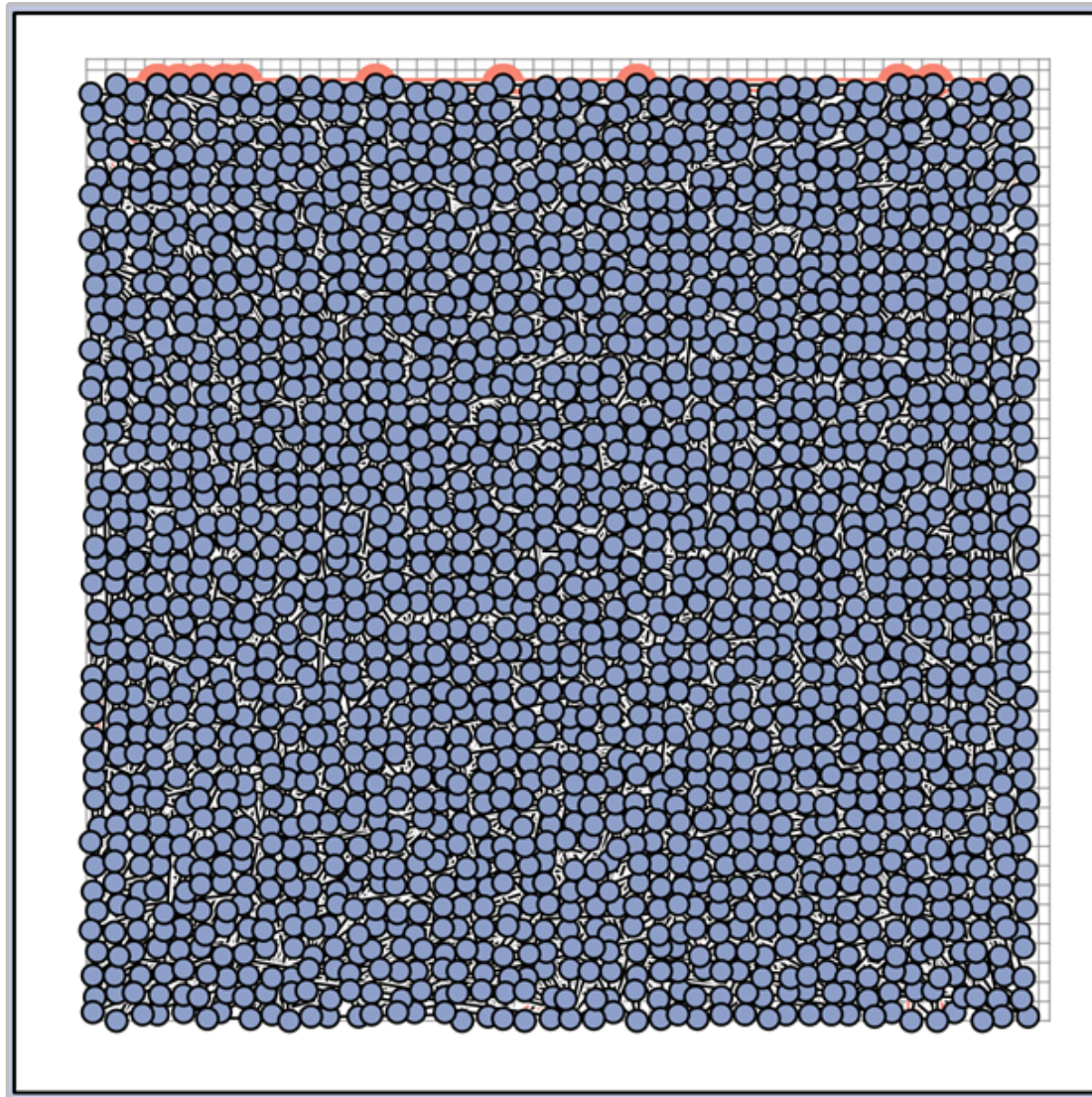
graph **13**



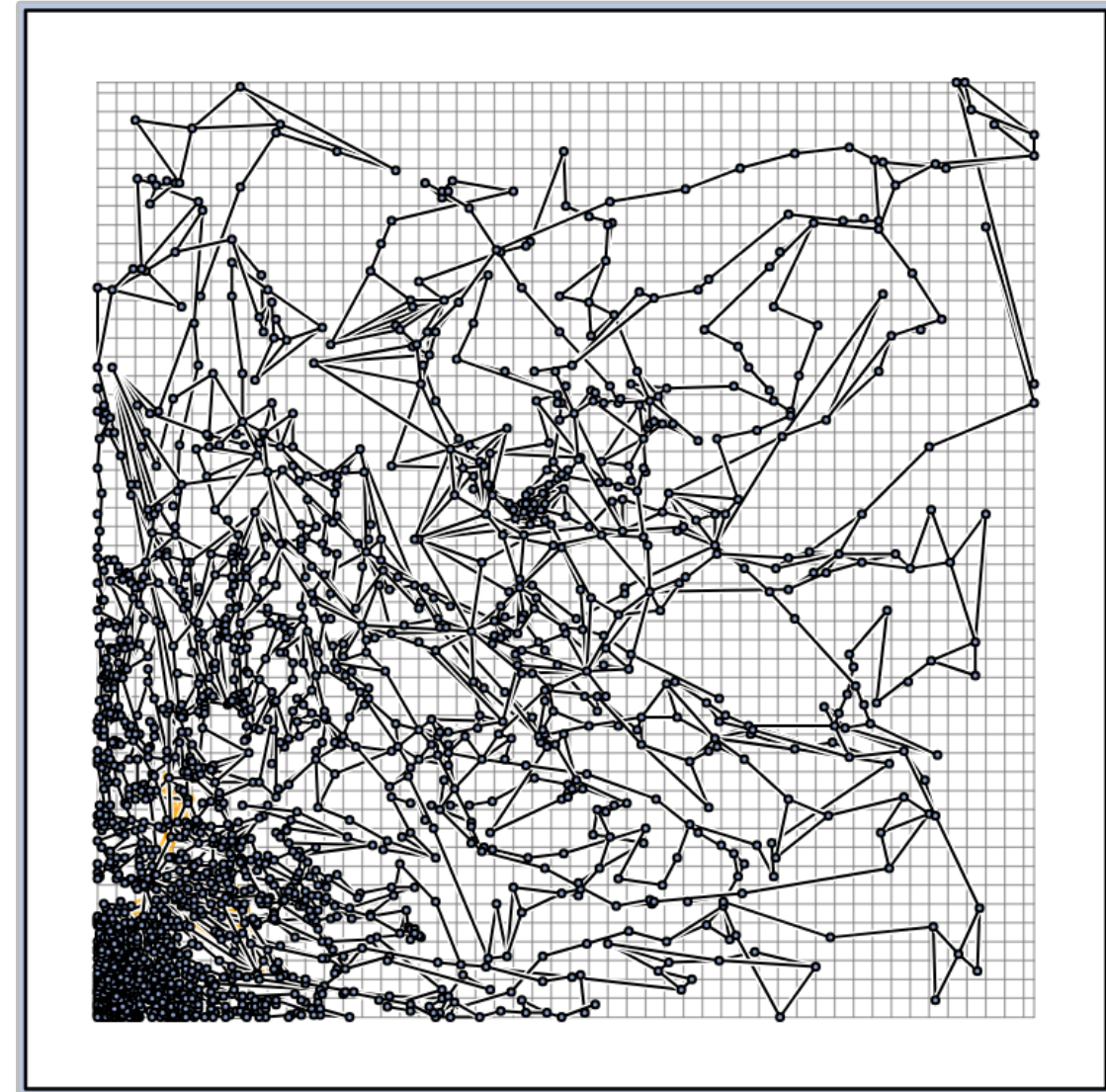
best automatic

LIVE CHALLENGE

Automatic category graphs



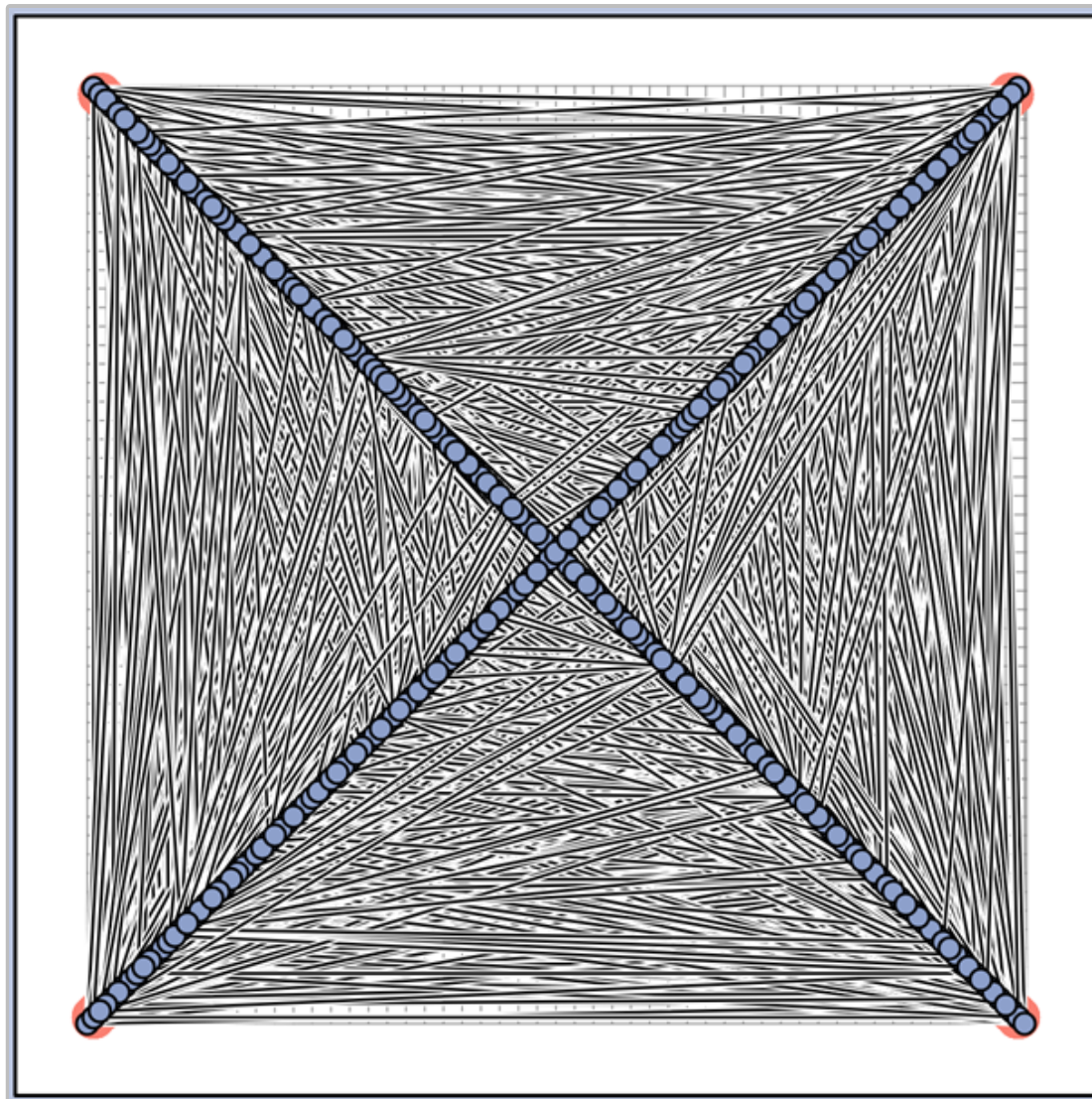
input
1776-planar
graph **13**



best automatic
Contraposto
5-planar

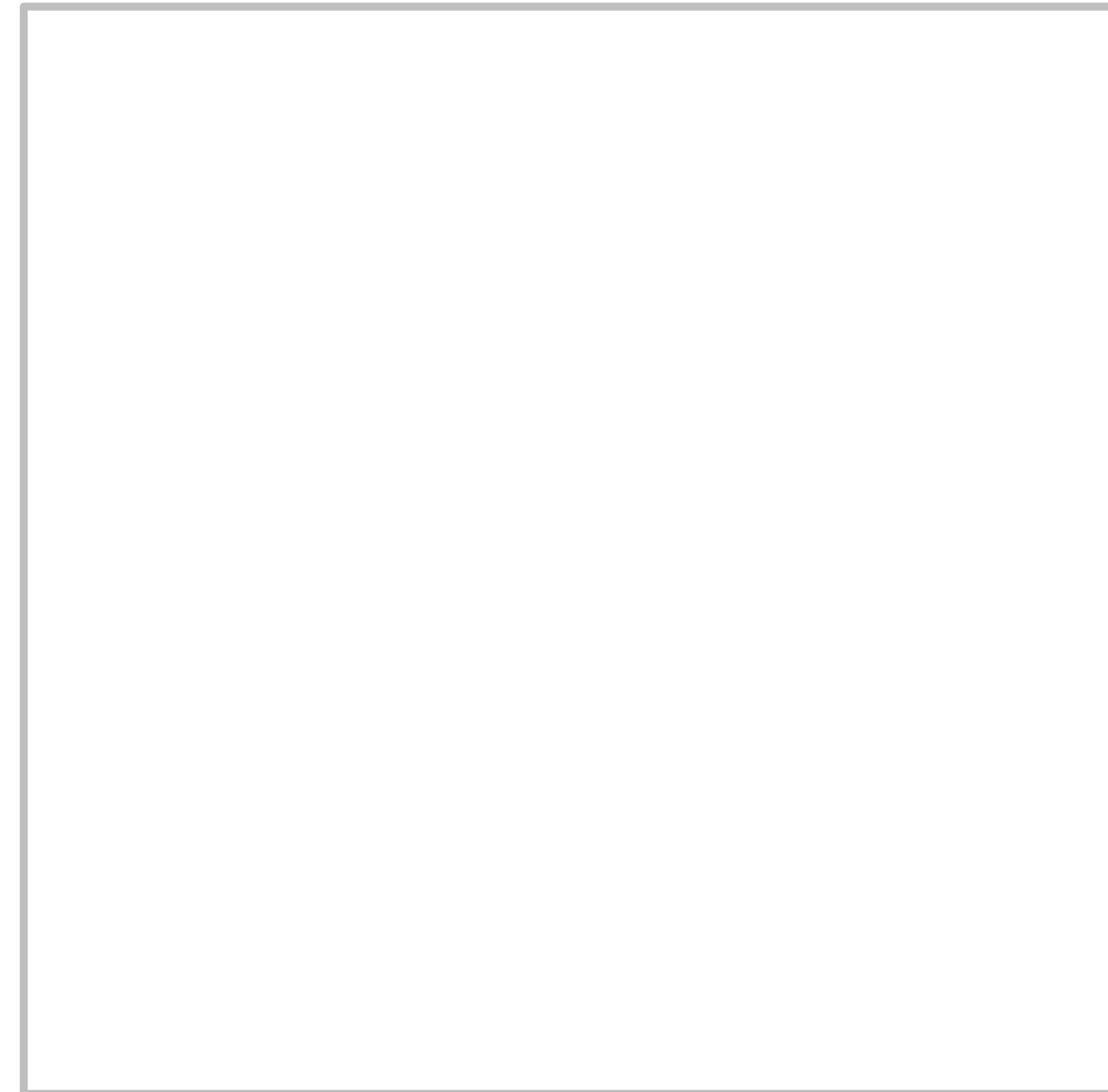
LIVE CHALLENGE

Automatic category graphs



input
3198-planar

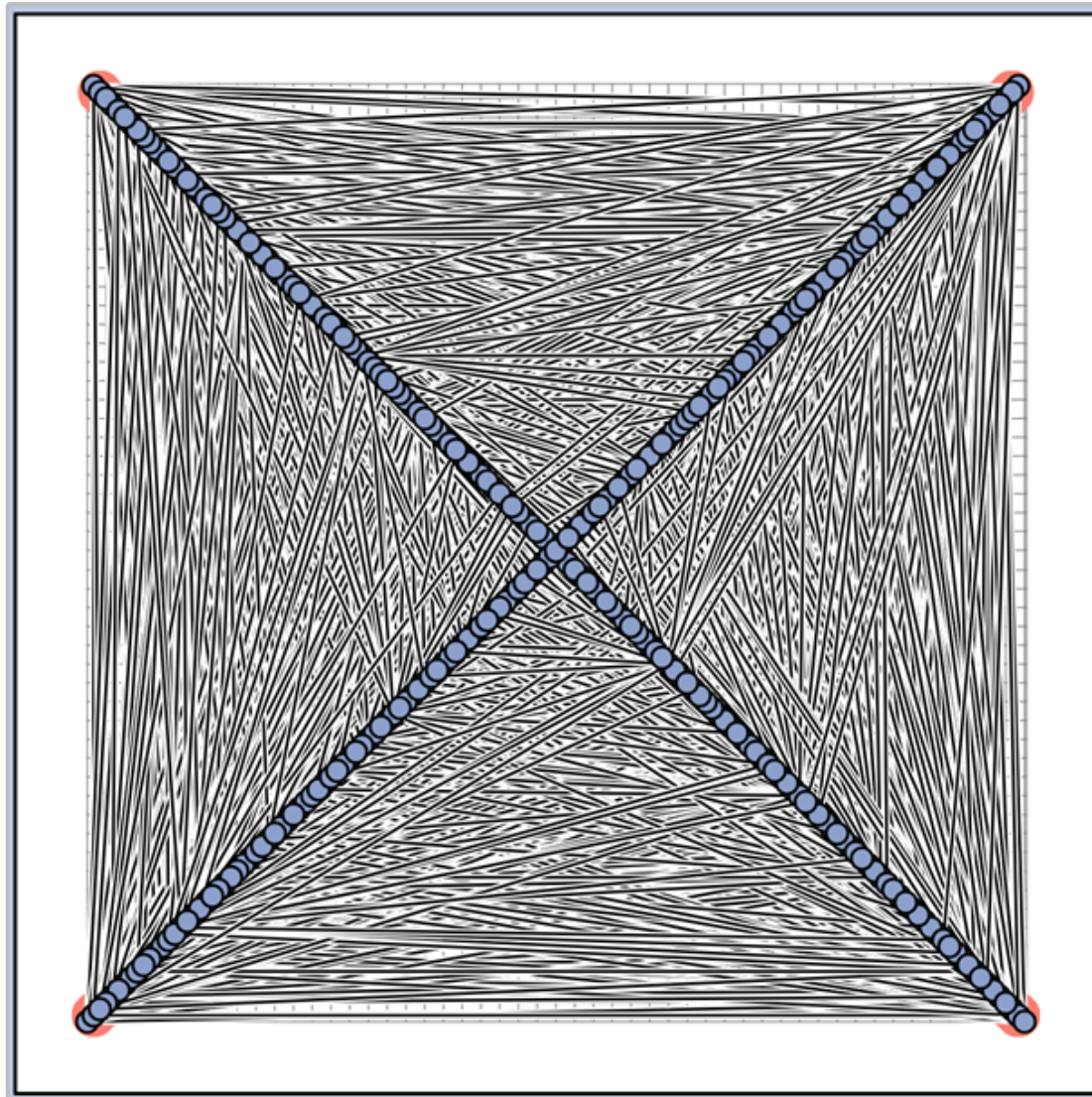
graph **14**



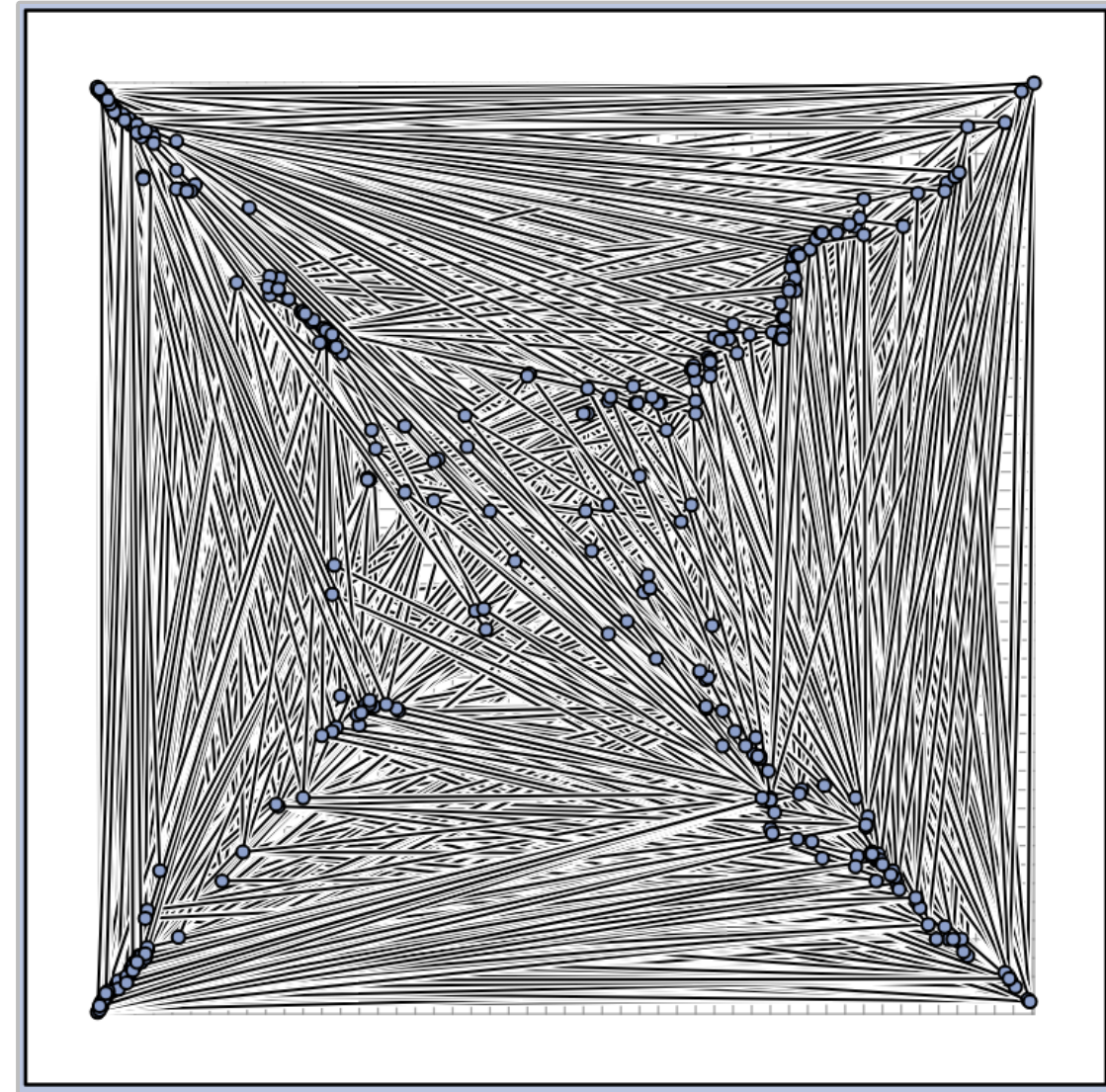
best automatic

LIVE CHALLENGE

Automatic category graphs



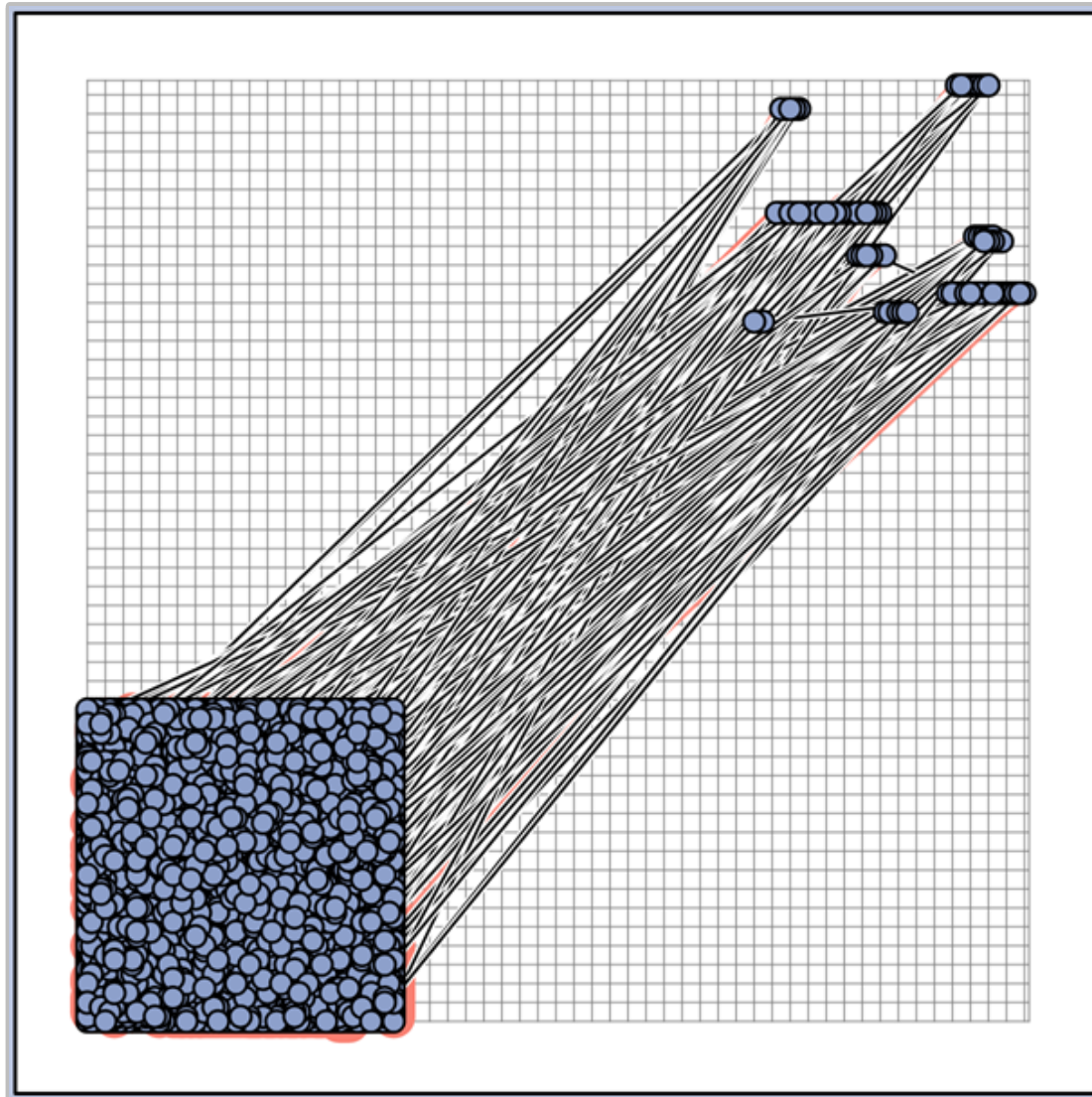
input
3198-planar
graph **14**



best automatic
1-planar
934-planar

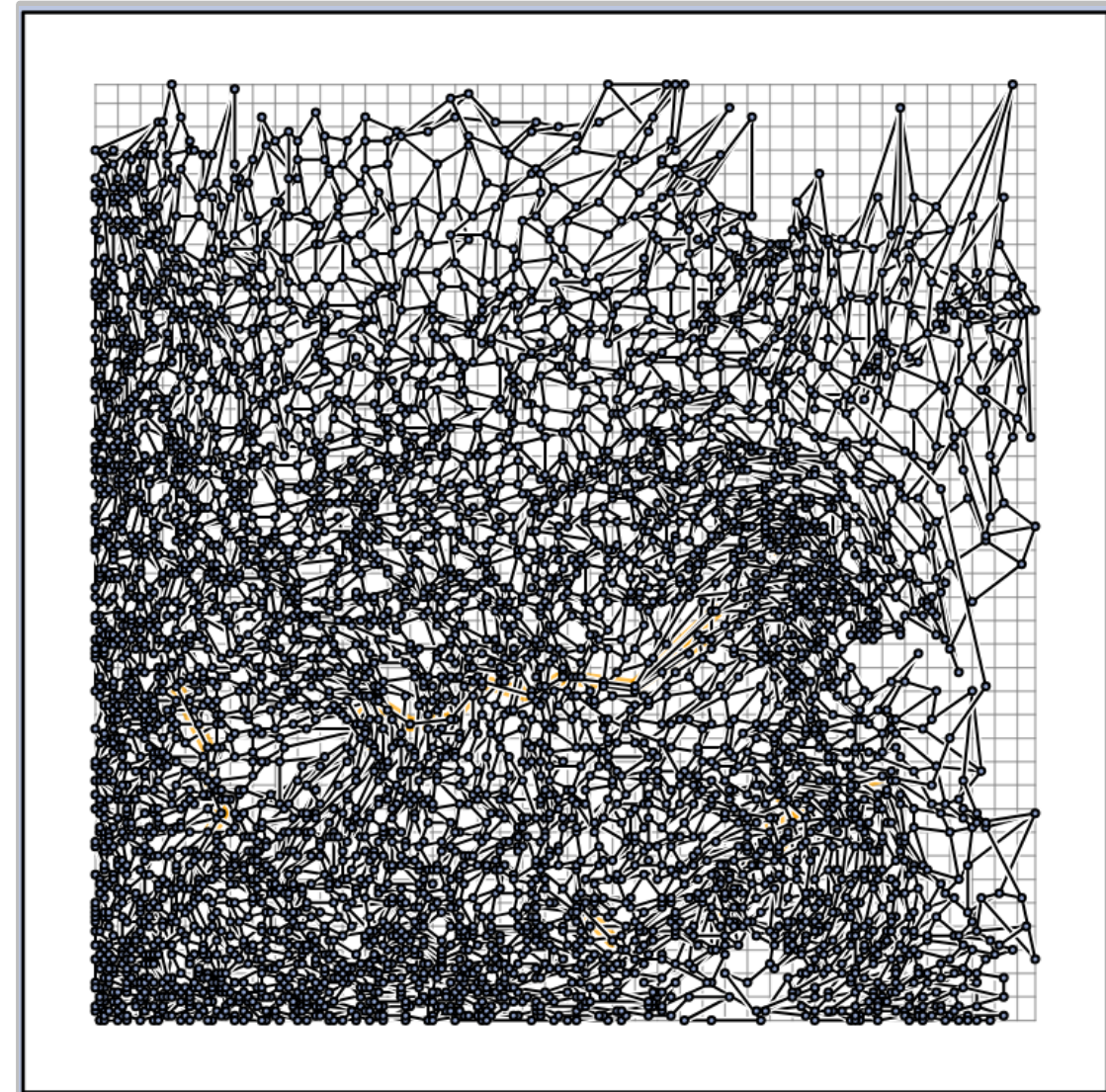
LIVE CHALLENGE

Automatic category graphs



input
4565-planar

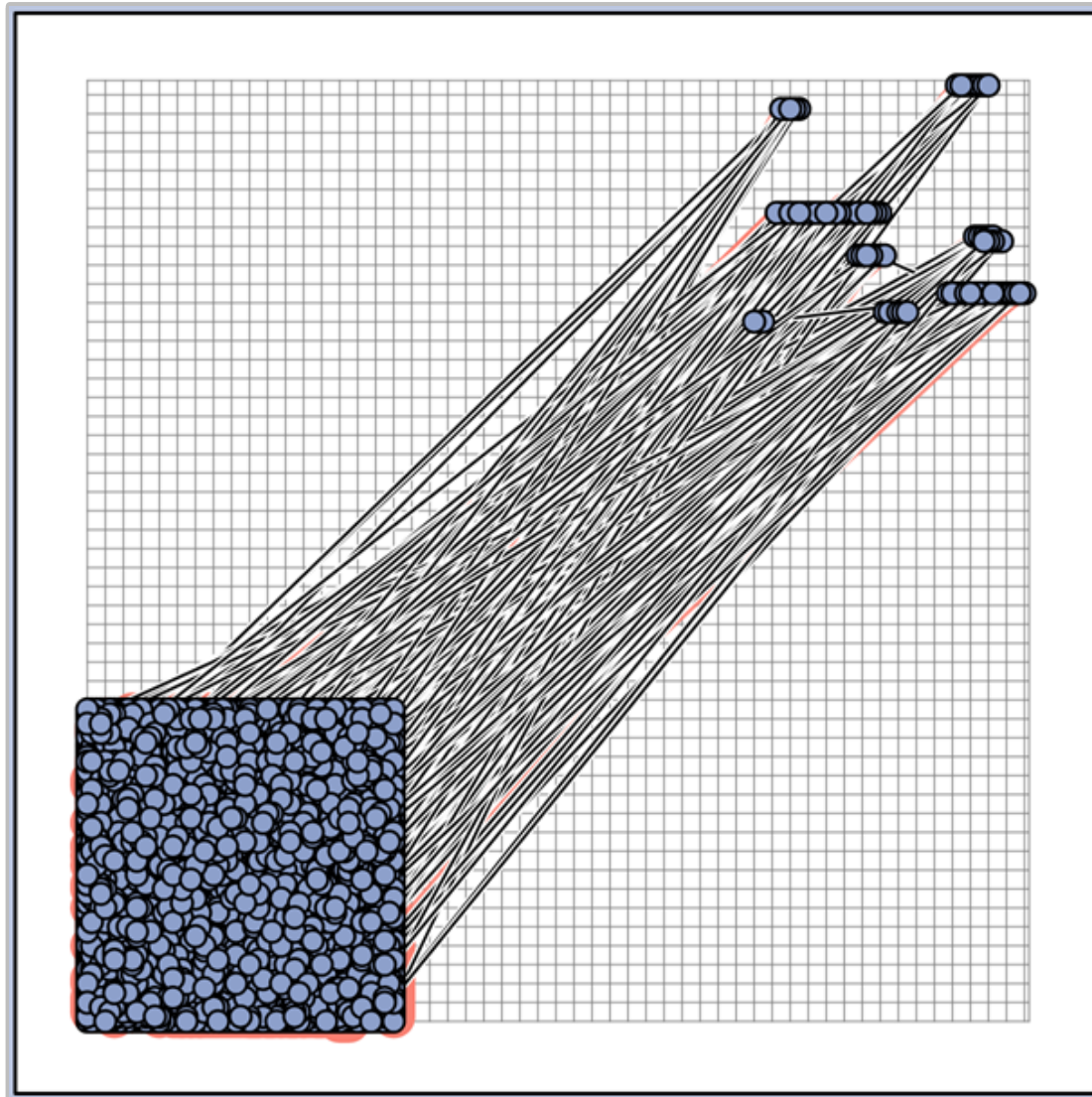
graph **15**



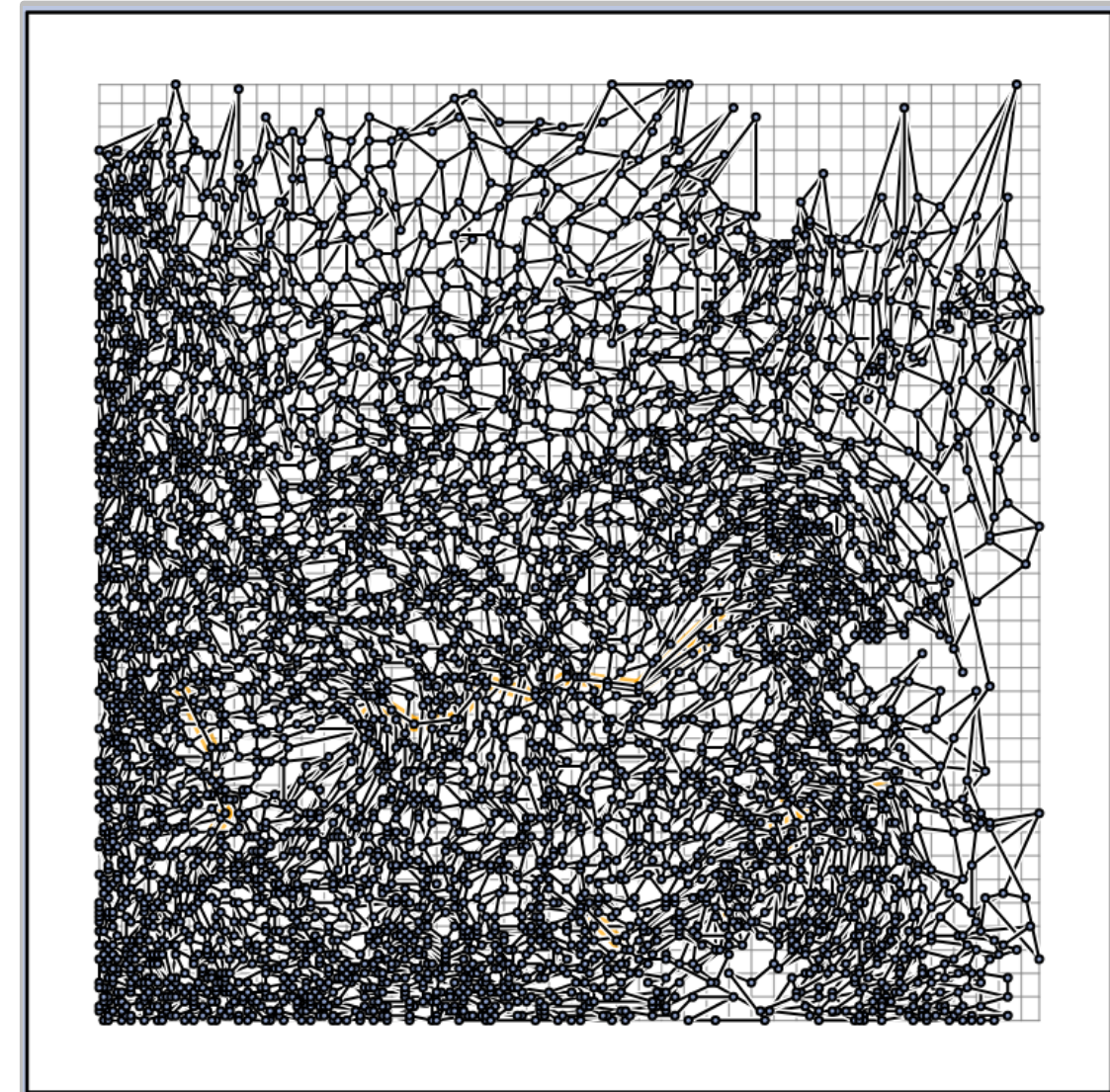
best automatic

LIVE CHALLENGE

Automatic category graphs



input
4565-planar
graph **15**



best automatic
Contraposto
5-planar

LIVE CHALLENGE

Automatic category results

LIVE CHALLENGE

Automatic category results

The Scores in Category Automatic

This contest is over!

Frozen Standings

PLACE	TEAM	SCORE
1	1-planar	15.0
2	MUCURLULAR	12.916417316311692
3	Novella	12.171439184800292
4	Wien1	9.10197778054574
5	G-UOI	8.75422020660116
6	Contraposto	7.516586261118336
7	Tum infinity and beyond	6.108147675736961
8	SALAHC	3.959387755102041
9	CM2	2.7346938775510203
10	admin	0.4982698961937717

LIVE CHALLENGE

Automatic category results

graph

Stress tested

MUCURLULAR

Tum infinity and beyond

CTRL+ALT+RESERVE

CM2

Novella

Wien1

1-planar

SALAHC

G-UOI

Contraposto

LIVE CHALLENGE

Automatic category results

graph 1

Stress tested	1
MUCURLULAR	1
Tum infinity and beyond	1
CTRL+ALT+RESERVE	1
CM2	1
Novella	1
Wien1	1
1-planar	1
SALAHC	1
G-UOI	1
Contraposto	1

LIVE CHALLENGE

Automatic category results

graph 1 2

Stress tested	1	2
MUCURLULAR	1	2
Tum infinity and beyond	1	2
CTRL+ALT+RESERVE	1	2
CM2	1	
Novella	1	2
Wien1	1	3
1-planar	1	2
SALAHC	1	2
G-UIO	1	2
Contraposto	1	2

LIVE CHALLENGE

Automatic category results

graph	1	2	3
Stress tested	1	2	2
MUCURLULAR	1	2	2
Tum infinity and beyond	1	2	2
CTRL+ALT+RESERVE	1	2	2
CM2	1		4
Novella	1	2	2
Wien1	1	3	2
1-planar	1	2	2
SALAHC	1	2	4
G-UOI	1	2	2
Contraposto	1	2	2

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4
Stress tested		1	2	2	4
MUCURLULAR		1	2	2	4
Tum infinity and beyond		1	2	2	6
CTRL+ALT+RESERVE		1	2	2	4
CM2		1		4	4
Novella		1	2	2	4
Wien1		1	3	2	4
1-planar		1	2	2	4
SALAHC		1	2	4	4
G-UOI		1	2	2	4
Contraposto		1	2	2	4

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5
Stress tested		1	2	2	4	2
MUCURLULAR		1	2	2	4	2
Tum infinity and beyond		1	2	2	6	X
CTRL+ALT+RESERVE		1	2	2	4	2
CM2		1		4	4	X
Novella		1	2	2	4	2
Wien1		1	3	2	4	2
1-planar		1	2	2	4	2
SALAHC		1	2	4	4	2
G-UOI		1	2	2	4	2
Contraposto		1	2	2	4	2

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6
Stress tested		1	2	2	4	2	1
MUCURLULAR		1	2	2	4	2	1
Tum infinity and beyond		1	2	2	6	X	2
CTRL+ALT+RESERVE		1	2	2	4	2	1
CM2		1		4	4	X	
Novella		1	2	2	4	2	1
Wien1		1	3	2	4	2	1
1-planar		1	2	2	4	2	1
SALAHC		1	2	4	4	2	1
G-UOI		1	2	2	4	2	1
Contraposto		1	2	2	4	2	1

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6	7
Stress tested		1	2	2	4	2	1	2
MUCURLULAR		1	2	2	4	2	1	2
Tum infinity and beyond		1	2	2	6	X	2	5
CTRL+ALT+RESERVE		1	2	2	4	2	1	2
CM2		1		4	4	X		
Novella		1	2	2	4	2	1	2
Wien1		1	3	2	4	2	1	3
1-planar		1	2	2	4	2	1	2
SALAHC		1	2	4	4	2	1	2
G-UOI		1	2	2	4	2	1	2
Contraposto		1	2	2	4	2	1	2

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6	7	8
Stress tested		1	2	2	4	2	1	2	3
MUCURLULAR		1	2	2	4	2	1	2	3
Tum infinity and beyond		1	2	2	6	X	2	5	4
CTRL+ALT+RESERVE		1	2	2	4	2	1	2	3
CM2		1		4	4	X			
Novella		1	2	2	4	2	1	2	3
Wien1		1	3	2	4	2	1	3	6
1-planar		1	2	2	4	2	1	2	3
SALAHC		1	2	4	4	2	1	2	4
G-UOI		1	2	2	4	2	1	2	4
Contraposto		1	2	2	4	2	1	2	3

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6	7	8	9
Stress tested		1	2	2	4	2	1	2	3	3
MUCURLULAR		1	2	2	4	2	1	2	3	X
Tum infinity and beyond		1	2	2	6	X	2	5	4	
CTRL+ALT+RESERVE		1	2	2	4	2	1	2	3	X
CM2		1		4	4	X				
Novella		1	2	2	4	2	1	2	3	13
Wien1		1	3	2	4	2	1	3	6	
1-planar		1	2	2	4	2	1	2	3	0
SALAHC		1	2	4	4	2	1	2	4	X
G-UOI		1	2	2	4	2	1	2	4	X
Contraposto		1	2	2	4	2	1	2	3	1

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6	7	8	9	10
Stress tested		1	2	2	4	2	1	2	3	3	7
MUCURLULAR		1	2	2	4	2	1	2	3	X	7
Tum infinity and beyond		1	2	2	6	X	2	5	4		9
CTRL+ALT+RESERVE		1	2	2	4	2	1	2	3	X	7
CM2		1		4	4	X					
Novella		1	2	2	4	2	1	2	3	13	7
Wien1		1	3	2	4	2	1	3	6		8
1-planar		1	2	2	4	2	1	2	3	0	7
SALAHC		1	2	4	4	2	1	2	4	X	7
G-UOI		1	2	2	4	2	1	2	4	X	8
Contraposto		1	2	2	4	2	1	2	3	1	7

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6	7	8	9	10	11
Stress tested		1	2	2	4	2	1	2	3	3	7	6
MUCURLULAR		1	2	2	4	2	1	2	3	X	7	7
Tum infinity and beyond		1	2	2	6	X	2	5	4		9	X
CTRL+ALT+RESERVE		1	2	2	4	2	1	2	3	X	7	5
CM2		1		4	4	X						X
Novella		1	2	2	4	2	1	2	3		13	7
Wien1		1	3	2	4	2	1	3	6		8	54
1-planar		1	2	2	4	2	1	2	3	0	7	3
SALAHC		1	2	4	4	2	1	2	4	X	7	5
G-UOI		1	2	2	4	2	1	2	4	X	8	X
Contraposto		1	2	2	4	2	1	2	3	1	7	5

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6	7	8	9	10	11	12
Stress tested		1	2	2	4	2	1	2	3	3	7	6	30
MUCURLULAR		1	2	2	4	2	1	2	3	X	7	7	31
Tum infinity and beyond		1	2	2	6	X	2	5	4		9	X	
CTRL+ALT+RESERVE		1	2	2	4	2	1	2	3	X	7	5	32
CM2		1		4	4	X						X	
Novella		1	2	2	4	2	1	2	3		13	7	30
Wien1		1	3	2	4	2	1	3	6		8	54	47
1-planar		1	2	2	4	2	1	2	3	0	7	3	28
SALAHC		1	2	4	4	2	1	2	4	X	7	5	30
G-UOI		1	2	2	4	2	1	2	4	X	8	X	X
Contraposto		1	2	2	4	2	1	2	3	1	7	5	29

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6	7	8	9	10	11	12	13
Stress tested		1	2	2	4	2	1	2	3	3	7	6	30	6
MUCURLULAR		1	2	2	4	2	1	2	3	X	7	7	31	9
Tum infinity and beyond		1	2	2	6	X	2	5	4		9	X		
CTRL+ALT+RESERVE		1	2	2	4	2	1	2	3	X	7	5	32	5
CM2		1		4	4	X						X		X
Novella		1	2	2	4	2	1	2	3	13	7	7	30	7
Wien1		1	3	2	4	2	1	3	6		8	54	47	15
1-planar		1	2	2	4	2	1	2	3	0	7	3	28	5
SALAHC		1	2	4	4	2	1	2	4	X	7	5	30	5
G-UOI		1	2	2	4	2	1	2	4	X	8	X	X	X
Contraposto		1	2	2	4	2	1	2	3	1	7	5	29	5

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Stress tested		1	2	2	4	2	1	2	3	3	7	6	30	6	963
MUCURLULAR		1	2	2	4	2	1	2	3	X	7	7	31	9	1022
Tum infinity and beyond		1	2	2	6	X	2	5	4		9	X			
CTRL+ALT+RESERVE		1	2	2	4	2	1	2	3	X	7	5	32	5	1051
CM2		1		4	4	X						X		X	X
Novella		1	2	2	4	2	1	2	3	13	7	7	30	7	1765
Wien1		1	3	2	4	2	1	3	6		8	54	47	15	
1-planar		1	2	2	4	2	1	2	3	0	7	3	28	5	934
SALAHC		1	2	4	4	2	1	2	4	X	7	5	30	5	1392
G-UOI		1	2	2	4	2	1	2	4	X	8	X	X	X	X
Contraposto		1	2	2	4	2	1	2	3	1	7	5	29	5	954

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Stress tested		1	2	2	4	2	1	2	3	3	7	6	30	6	963	6
MUCURLULAR		1	2	2	4	2	1	2	3	X	7	7	31	9	1022	12
Tum infinity and beyond		1	2	2	6	X	2	5	4		9	X				X
CTRL+ALT+RESERVE		1	2	2	4	2	1	2	3	X	7	5	32	5	1051	6
CM2		1		4	4	X						X		X	X	
Novella		1	2	2	4	2	1	2	3	13	7	7	30	7	1765	8
Wien1		1	3	2	4	2	1	3	6		8	54	47	15		
1-planar		1	2	2	4	2	1	2	3	0	7	3	28	5	934	5
SALAHC		1	2	4	4	2	1	2	4	X	7	5	30	5	1392	7
G-UOI		1	2	2	4	2	1	2	4	X	8	X	X	X	X	X
Contraposto		1	2	2	4	2	1	2	3	1	7	5	29	5	954	5

LIVE CHALLENGE

Automatic category results

graph 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Stress tested	1	2	2	4	2	1	2	3	3	7	6	30	6	963	6
MUCURLULAR	1	2	2	4	2	1	2	3	X	7	7	31	9	1022	12
Turn infinity and beyond	1	2	2	4	X	2	5	4	2	X					X



Behzod Kahkimov & Huixue Chen

Stress tested

Wien1	1	3	2	4	2	1	3	6		8	54	47	15		
1-planar	1	2	2	4	2	1	2	3	0	7	3	28	5	934	5
SALAHC	1	2	4	4	2	1	2	4	X	7	5	30	5	1392	7
G-UOI	1	2	2	4	2	1	2	4	X	8	X	X	X	X	X
Contraposto	1	2	2	4	2	1	2	3	1	7	5	29	5	954	5

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Stress tested		1	2	2	4	2	1	2	3	3	7	6	30	6	963	6
MUCURLULAR		1	2	2	4	2	1	2	3	X	7	7	31	9	1022	12
Tum infinity and beyond		1	2	2	6	X	2	5	4		9	X				X
CTRL+ALT+RESERVE		1	2	2	4	2	1	2	3	X	7	5	32	5	1051	6
CM2		1		4	4	X						X		X	X	
Novella		1	2	2	4	2	1	2	3	1	7	7	30	7	1745	8
 Daniel Kohrt <i>Contraposto</i>																
G-UOI		1	2	2	4	2	1	2	4	X	8	X	X	X	X	X
Contraposto		1	2	2	4	2	1	2	3	1	7	5	29	5	954	5

LIVE CHALLENGE

Automatic category results

	graph	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Stress tested		1	2	2	4	2	1	2	3	3	7	6	30	6	963	6
MUCURLULAR		1	2	2	4	2	1	2	3	X	7	7	31	9	1022	12
Turn infinity and beyond		1	2	2	6	X	2	5	1		0	X				X
 Christoph Weber																
<i>1-planar</i>																
Wien1		1	3	2	4	2	1	3	6		8	54	47	15		
1-planar		1	2	2	4	2	1	2	3	0	7	3	28	5	934	5
SALAHC		1	2	4	4	2	1	2	4	X	7	5	30	5	1392	7
G-UI		1	2	2	4	2	1	2	4	X	8	X	X	X	X	X
Contraposto		1	2	2	4	2	1	2	3	1	7	5	29	5	954	5

GRAPH DRAWING CONTEST

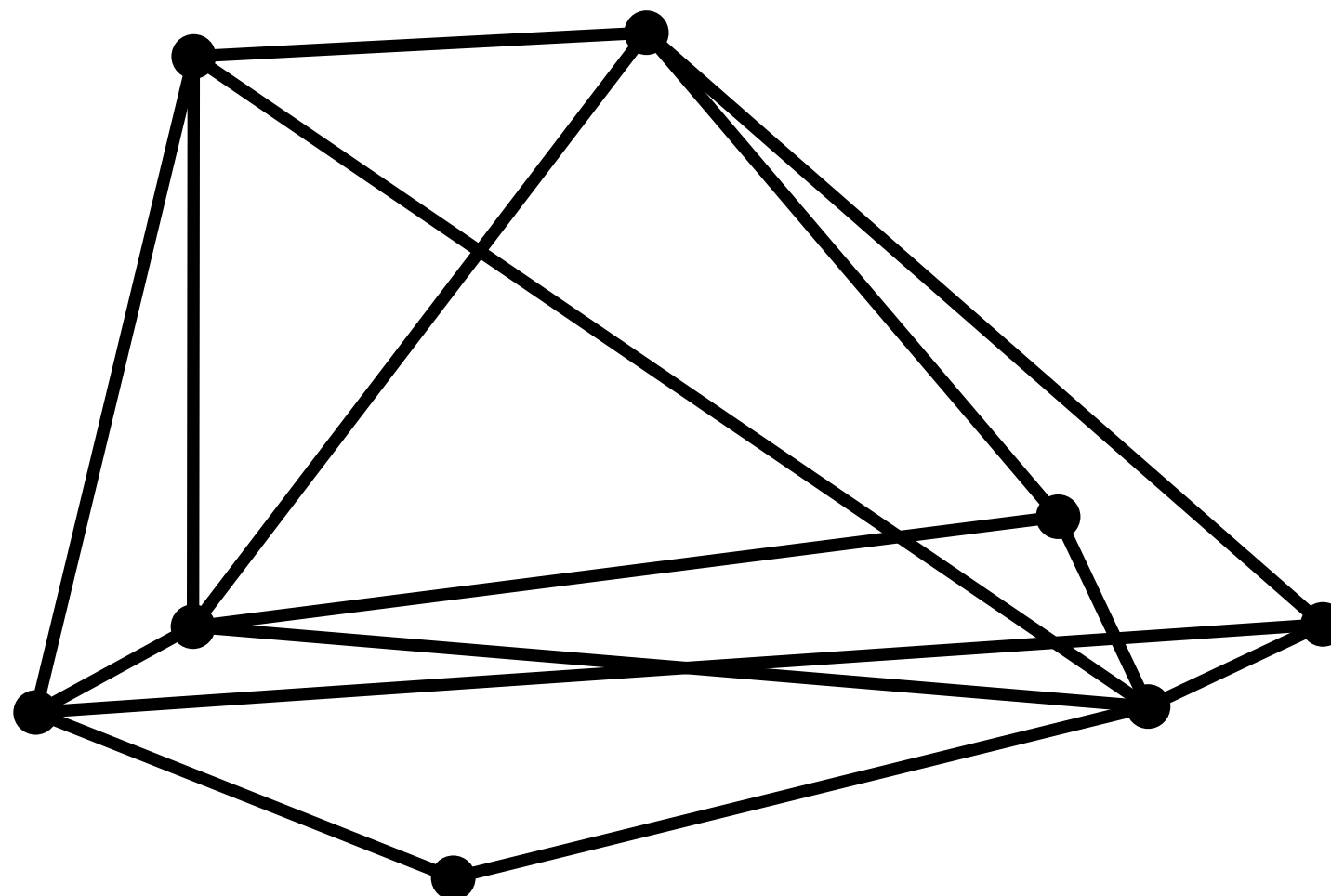
2027 Announcement

Announcement of Topics

GRAPH DRAWING CONTEST

2027 Live Challenge

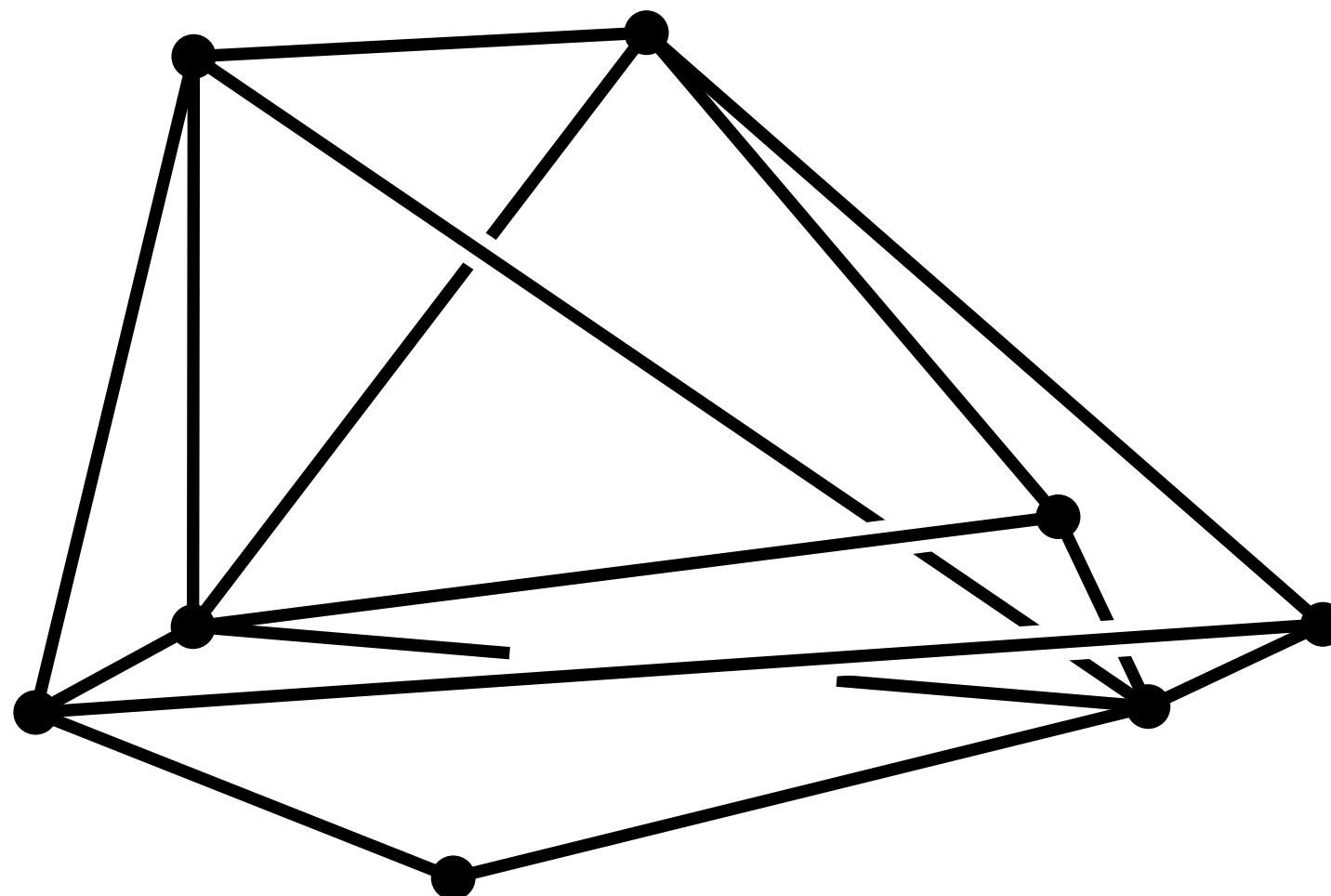
Minimize switches in Cased Drawings



GRAPH DRAWING CONTEST

2027 Live Challenge

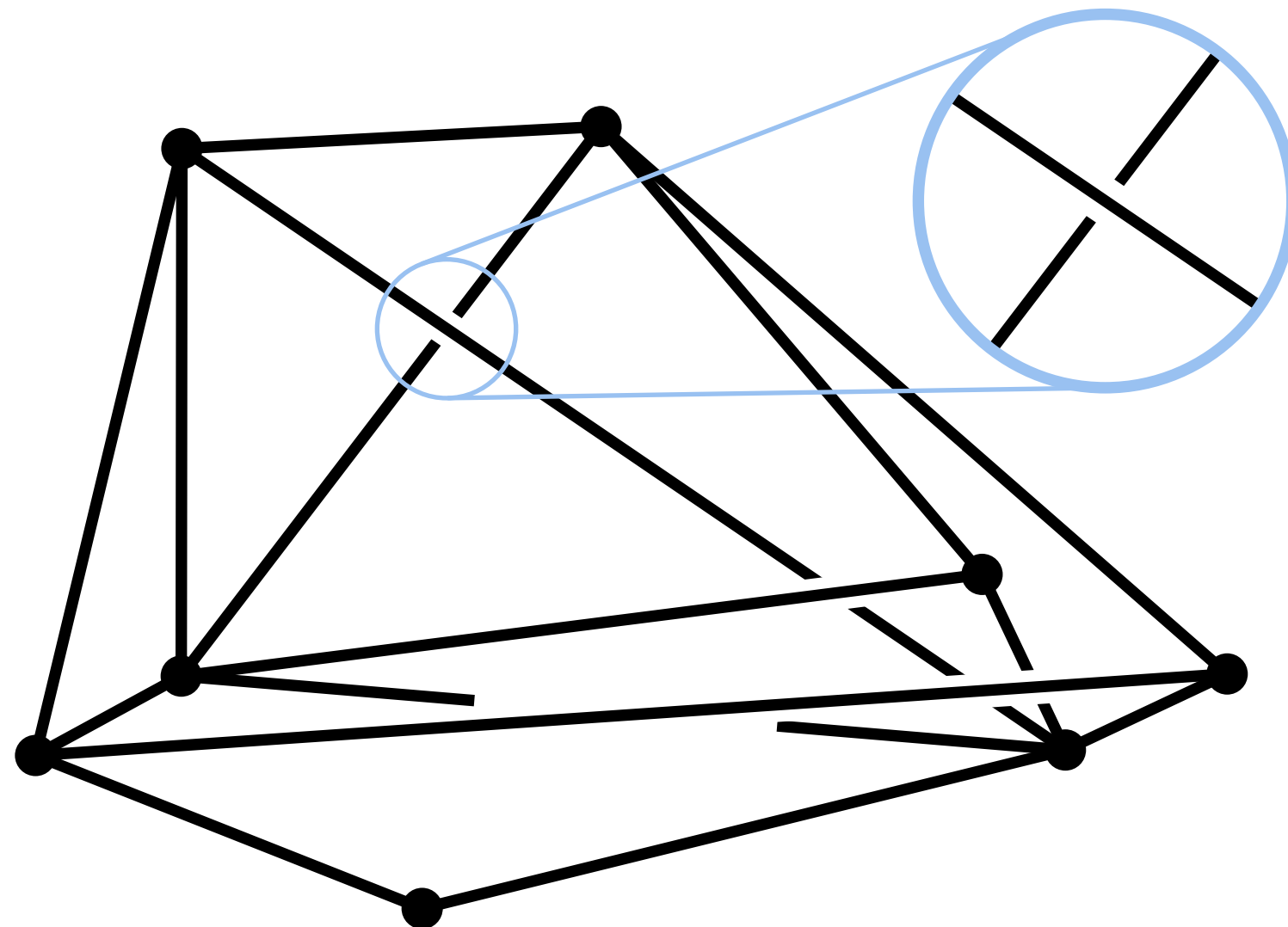
Minimize switches in Cased Drawings



GRAPH DRAWING CONTEST

2027 Live Challenge

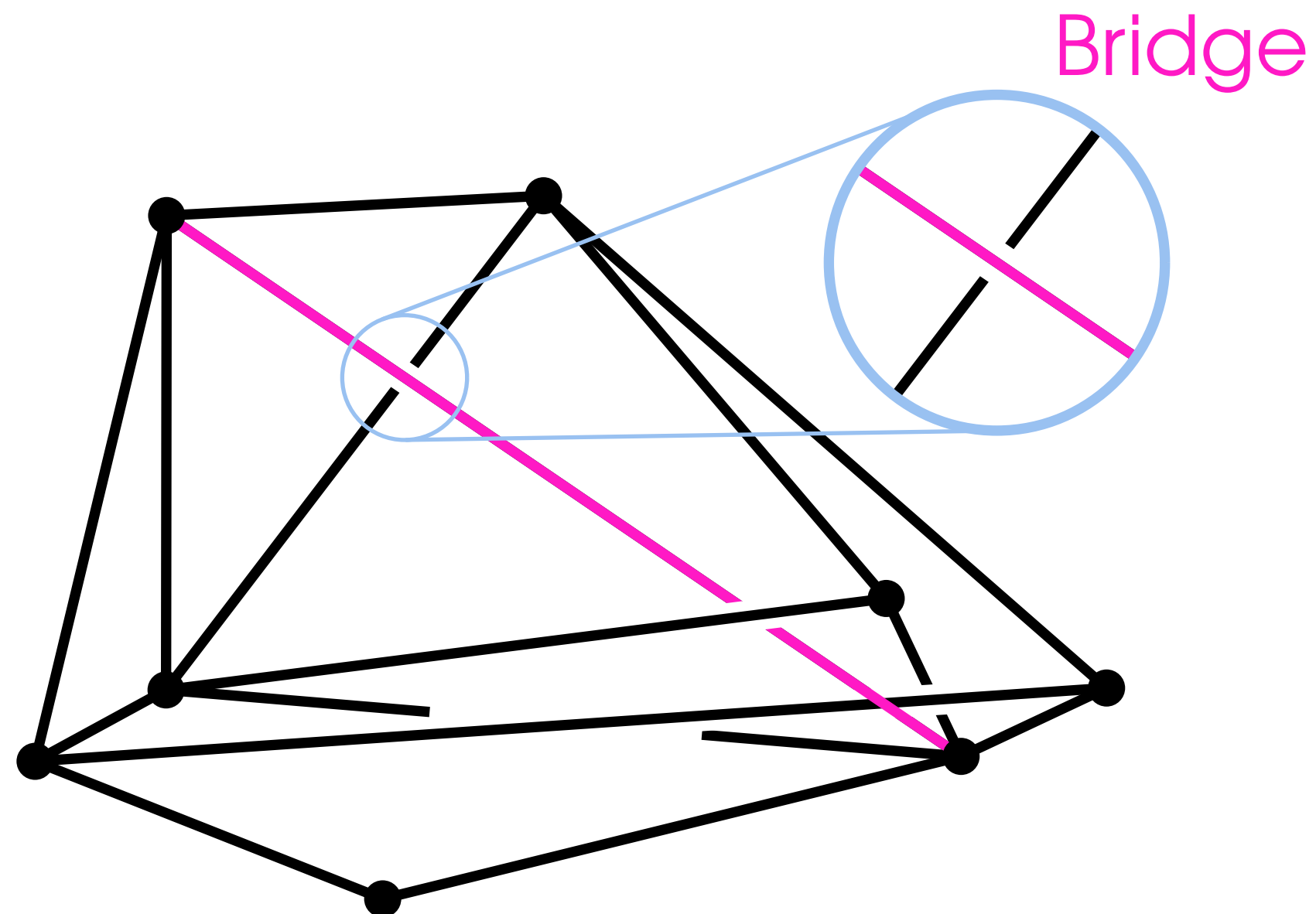
Minimize switches in Cased Drawings



GRAPH DRAWING CONTEST

2027 Live Challenge

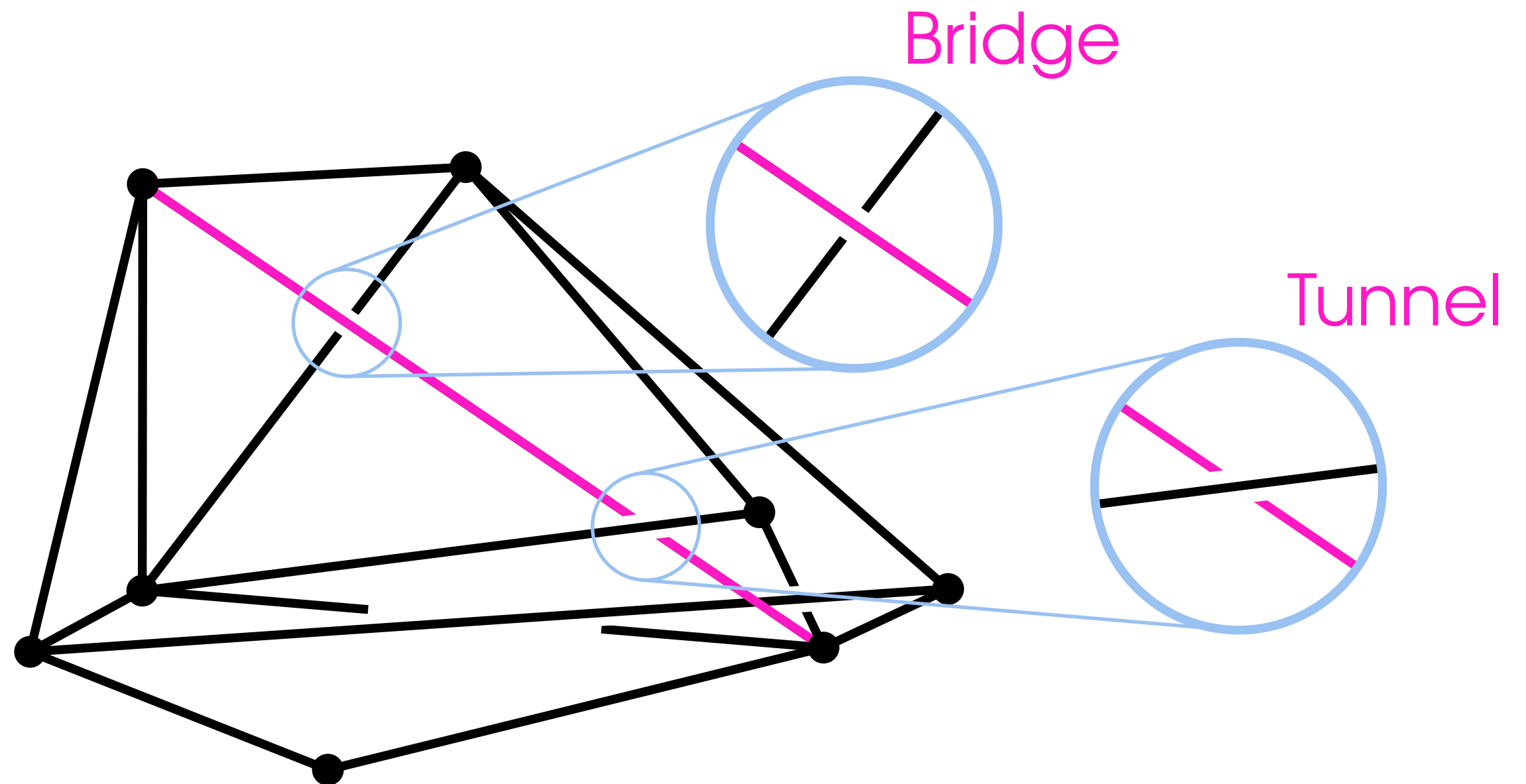
Minimize switches in Cased Drawings



GRAPH DRAWING CONTEST

2027 Live Challenge

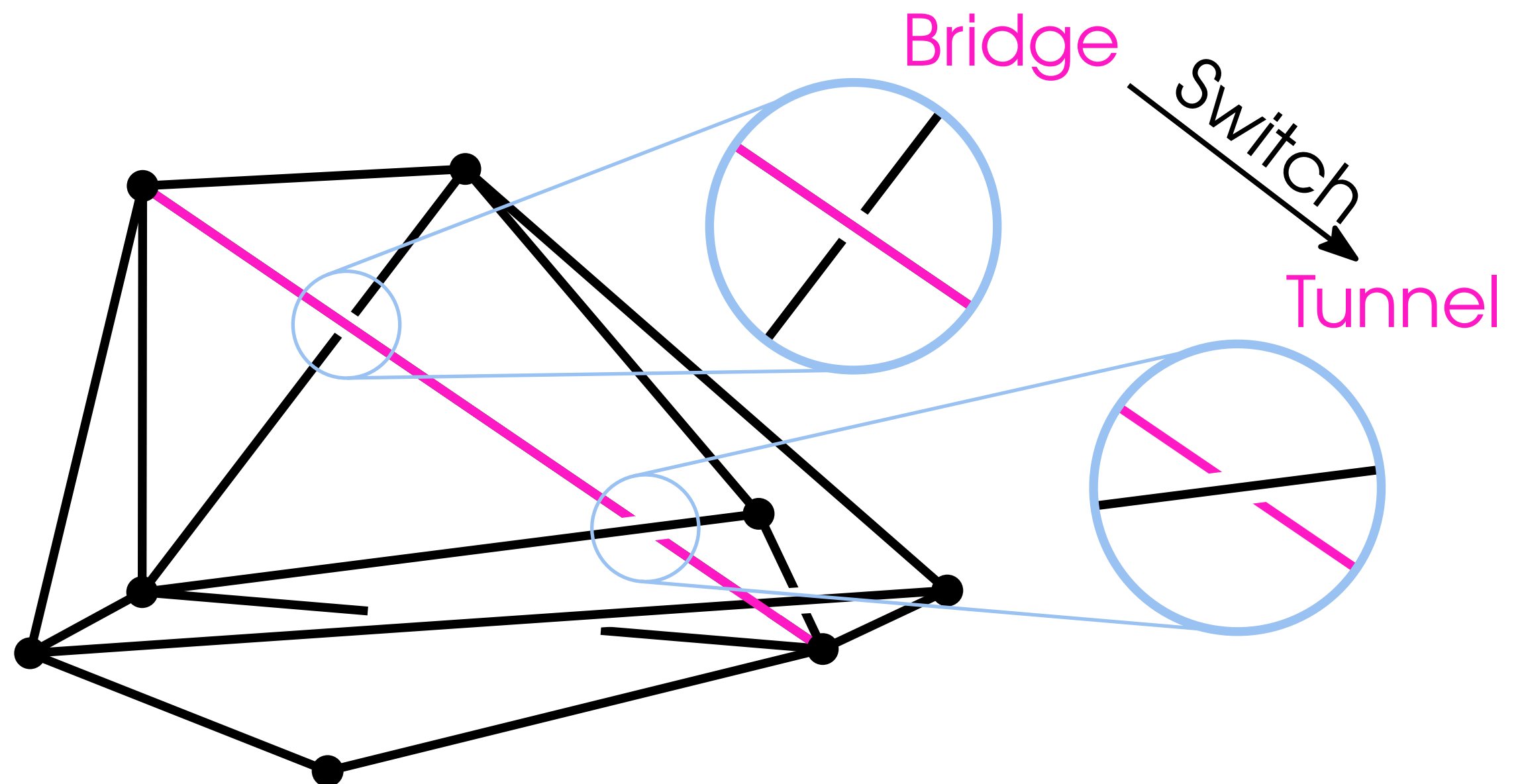
Minimize switches in Cased Drawings



GRAPH DRAWING CONTEST

2027 Live Challenge

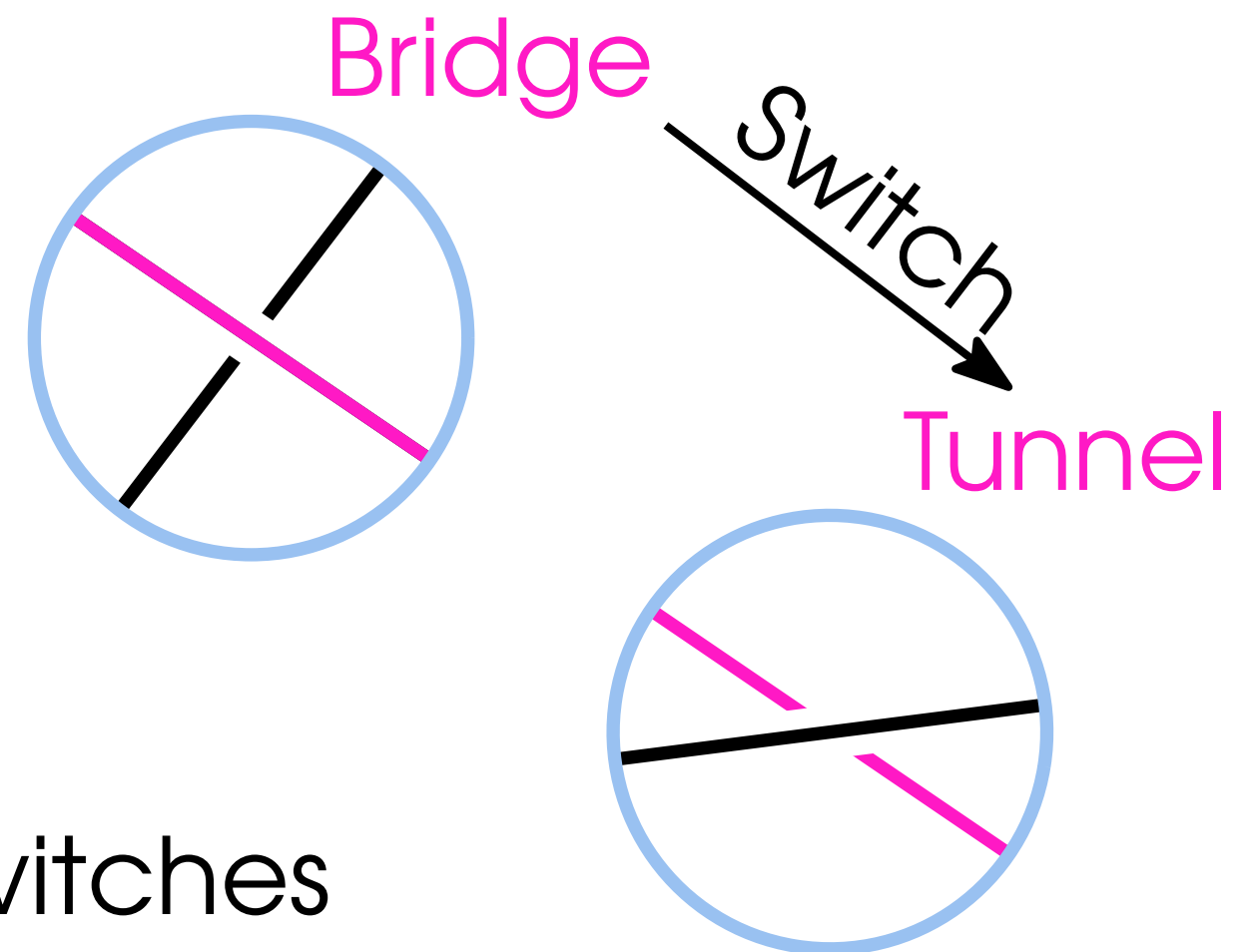
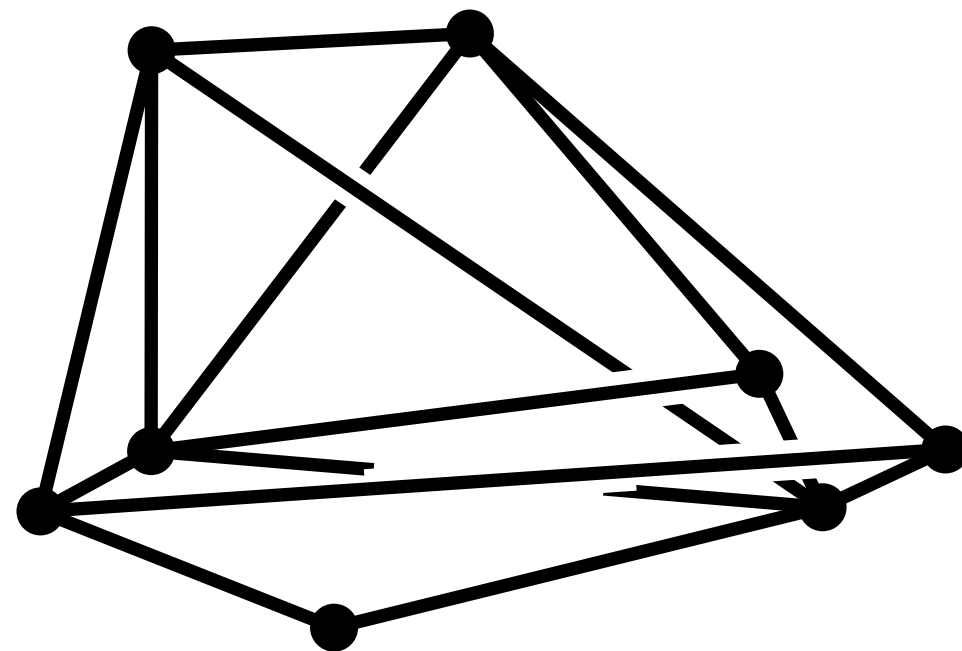
Minimize switches in Cased Drawings



GRAPH DRAWING CONTEST

2027 Live Challenge

Minimize switches in Cased Drawings



- minimize over all edge the switches
- change crossings between tunnels and bridges

GRAPH DRAWING CONTEST

2027 Creative Challenge

Does anyone want to have a guess?

GRAPH DRAWING CONTEST

2027 Creative Challenge

Does anyone want to have a guess?



GRAPH DRAWING CONTEST

2027 Creative Challenge

Does anyone want to have a guess?



GRAPH DRAWING CONTEST

2027 Creative Challenge

Does anyone want to have a guess?

KNOW/RIVALRY

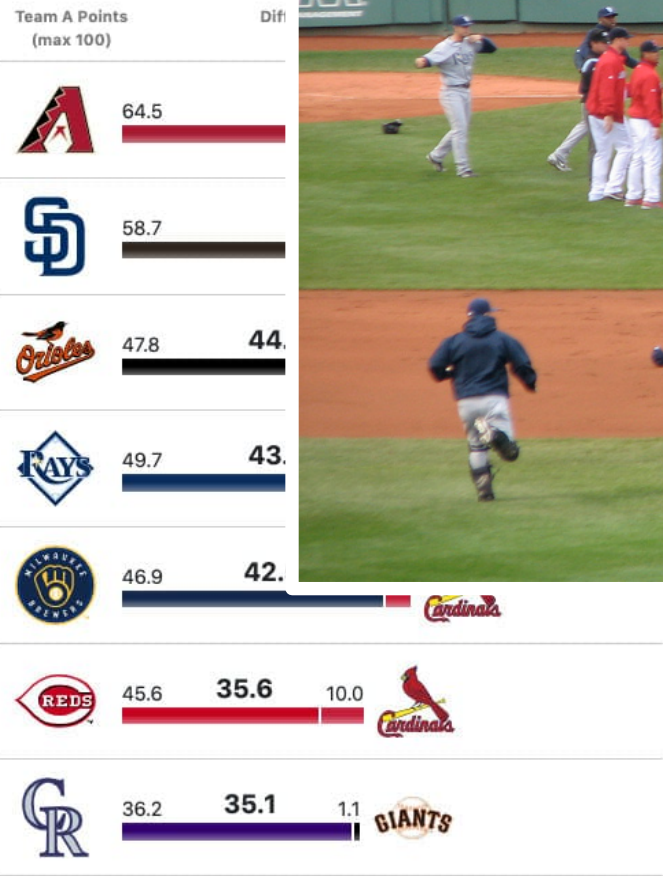
TOP 10 Most Intense Rivalries

WHAT DO THE DATA MEAN? [CLICK HERE](#) TO FIND OUT.



TOP 10 Unb

WHAT DO THE DATA M



GRAPH DRAWING CONTEST

2027 Creative Challenge

Does anyone want to have a guess?

KNOW/RIVALRY

TOP 10 Most Intense Rivalries

WHAT DO THE DATA MEAN? [CLICK HERE](#) TO FIND OUT.

Team A Points (max 100)	Aggregate Points (max 200)	Team B Points (max 100)
84.9	162.1	77.3
84.7	154.6	69.9
64.7		
41.2		
47.1		
45.8	74.2	26.3
41.9	68.7	26.8

TOP 10 Unbalanced

WHAT DO THE DATA MEAN?

Team A Points (max 100)	Difference
64.5	
46.9	42.1
45.6	35.6
36.2	35.1
	1.1

Stay Tuned for details

GRAPH DRAWING CONTEST

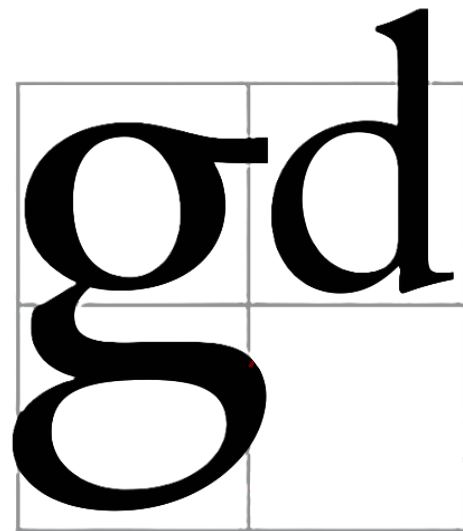
2027 Announcement

Committee Announcement

GRAPH DRAWING CONTEST

2027 Announcement

Committee Announcement

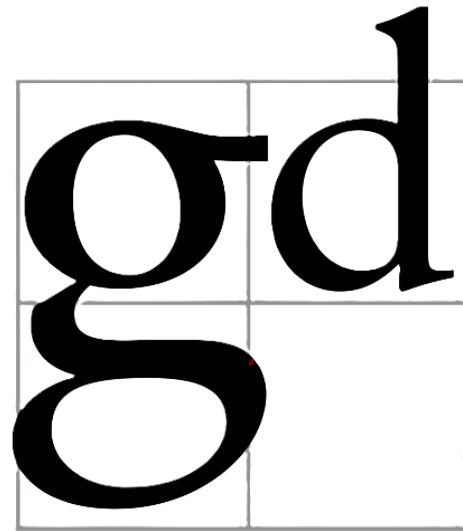
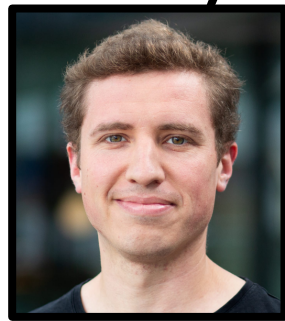


Contest
Committee

GRAPH DRAWING CONTEST

2027 Announcement

Committee Announcement



Contest
Committee

GRAPH DRAWING CONTEST

2027 Announcement

Committee Announcement



GRAPH DRAWING CONTEST

2027 Announcement

Committee Announcement



If you are inteterested in what we are doing, you
can contact us: gdnvcontest@gmail.com.