INSTITUT
DE RECHERCHE
EN INFORMATIQUE
FONDAMENTALE

Université
Paris Cité

cnrs

Théorie et algorithmique des graphes

Responsable : Reza Naserasr (2018-2023),

Next responsible: Valia Mitsou,

$6+5\times\frac{1}{2}$ permanents : $1+1\times\frac{1}{2}$ PR, $4+1\times\frac{1}{2}$ MC, $0+1\times\frac{1}{2}$ DR, 1 CR

1 PostDoc, $5+2\times\frac{1}{2}$ Doc, $0+1\times\frac{1}{2}$ Émérites

Total : $11+7\times\frac{1}{2}$ membres

Members considered for this report:

Pierre	Charbit	MCF (since 2017)
Monika	Csikos	MCF (since 2023, postdoc 2022-2023)
Fabien	De Montgolfier	MCF (since 2017)
Michel	Habib	Émérite (since 2019, PR 2017-2018)
Valia	Mitsou	MCF (since 2019, ATER 2017-2019)
Reza	Naserasr	CR (since 2017)
Matej	Stehlik	PR (since 2021)

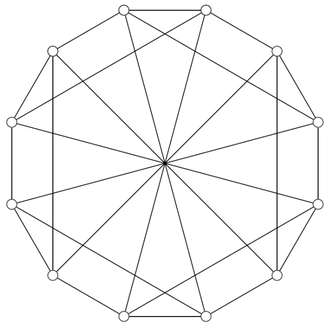
Members not considered for this report:

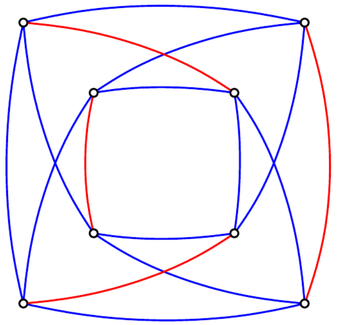
Guillaume	Chapuy,	DR (since 2017, presented by Combi team)
Mikael	Rabie	MCF (since 2020, presented by Dist Algo. team)
Vlady	Ravelomanana	PR (since 2017, presented by Combi team)
Laurent	Viennot	DR (since 2017, INRIA, presented by Dist. Algo. Team)

Special mention:

Pierluigi Crescenzi	PR 2019-2021, also a member of Dist. Algo team

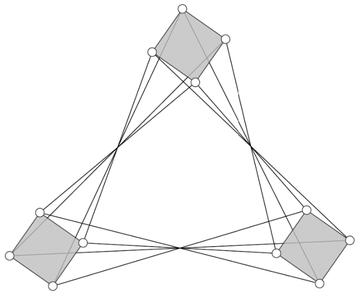
Graphs (or binary relations).

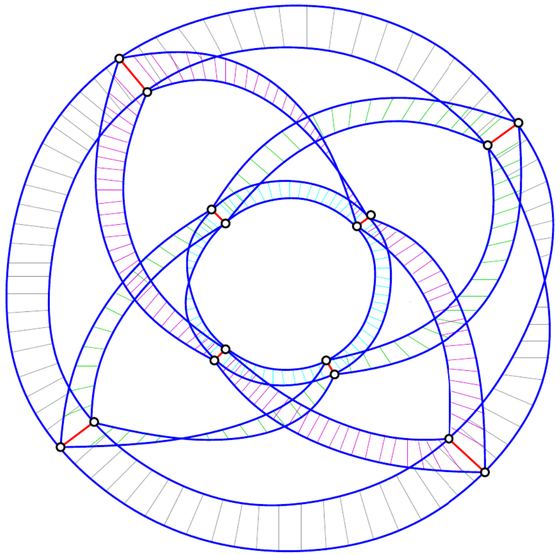




General goal: to have better algorithms for tasks such as

- Finding certain structures in a given graph
- Simplify a given structure
- Partition in certain manners





Structural study when general approach does not work.

Vie et organisation

- Regular seminar time: Tuesdays 3PM
- Daily meetings as the group is small
- Focus around ANR projects

Most notable quality of the team

All members are scientifically productive, work with graduate students, and publish (only) in high standard venues.

Journals: JCT B, SIAM J. Computing, SIAM J. Disc. Math. …

Conferences: FOCS, SODA, ICALP, STACS ....

Besoins

Allocation of more research time for MCF and PR members*
(in particular allowing for a better use of their work time).

* Further comments upon questions

Focus scientifique & projection

Better algorithms by:

- Ordering of the vertices, expert: Michel Habib

E.g. Charbit, Habib, Mouatadid, Naserasr. **A new graph parameter to measure linearity**. Journal of Graph Theory 103 (2023) 462 - 485.

Focus scientifique & projection

Restricting inputs by (toward forming better algorithms)

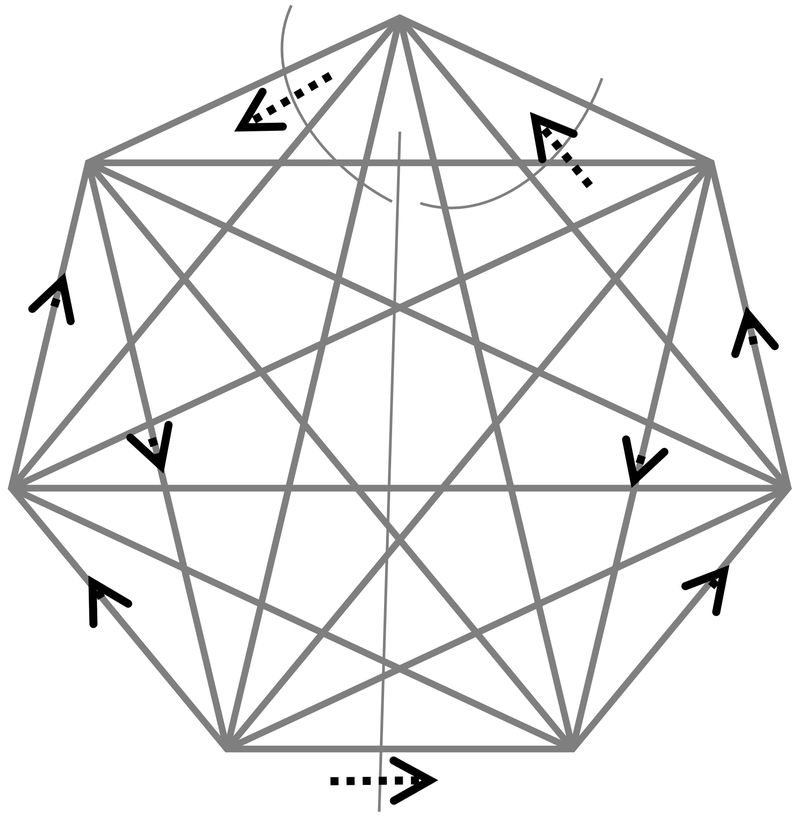
- Bounding width parameters, expert: Valia Mitsou
- Decomposing into modules, expert: Fabien de Montgolfier
- Limiting the topological look, expert: Matej Stehlik
- Bounding VC dimension, expert: Monika Csikos
- Forbidden minors, expert: Reza Naserasr
- Forbidden induced subgraphs, expert: Pierre Charbit

Focus scientifique

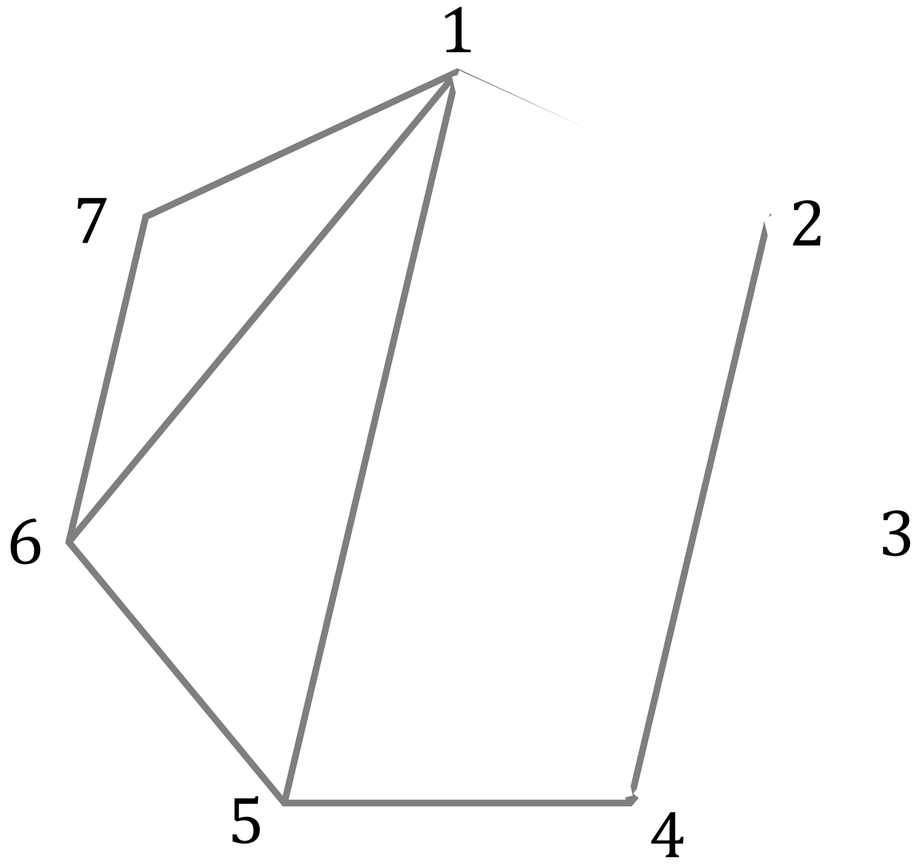
Digraph coloring:

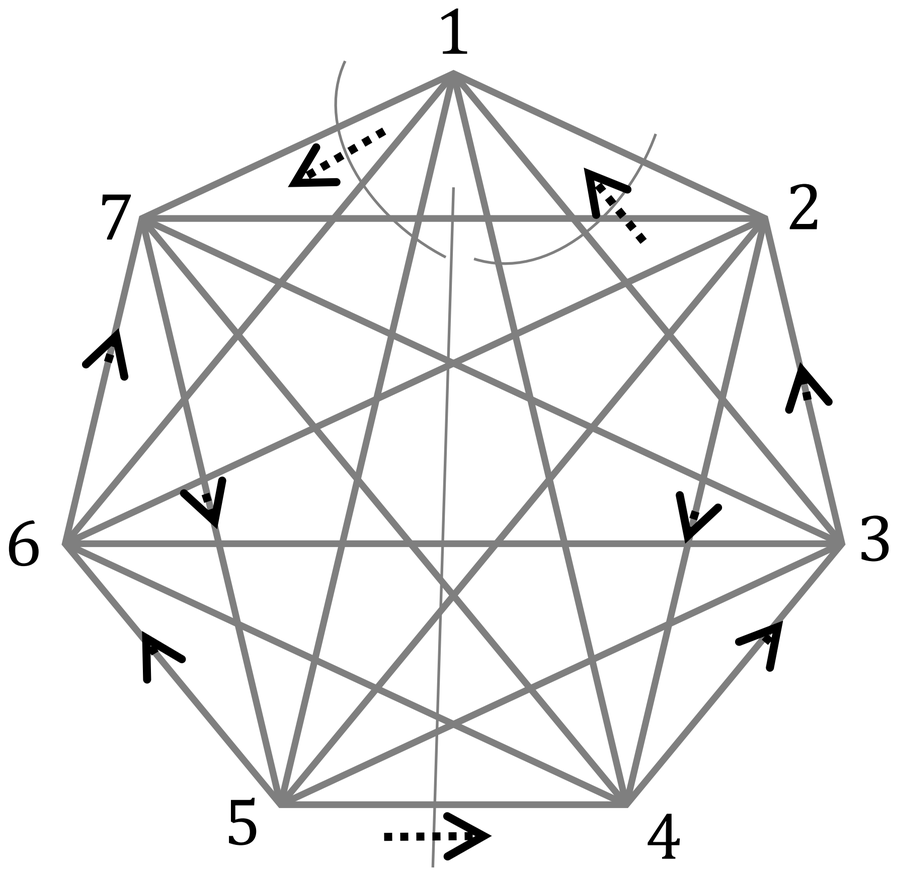
To partition vertices

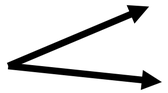
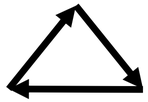
into acyclic sets.



Vertex-ordering and dicoloring:



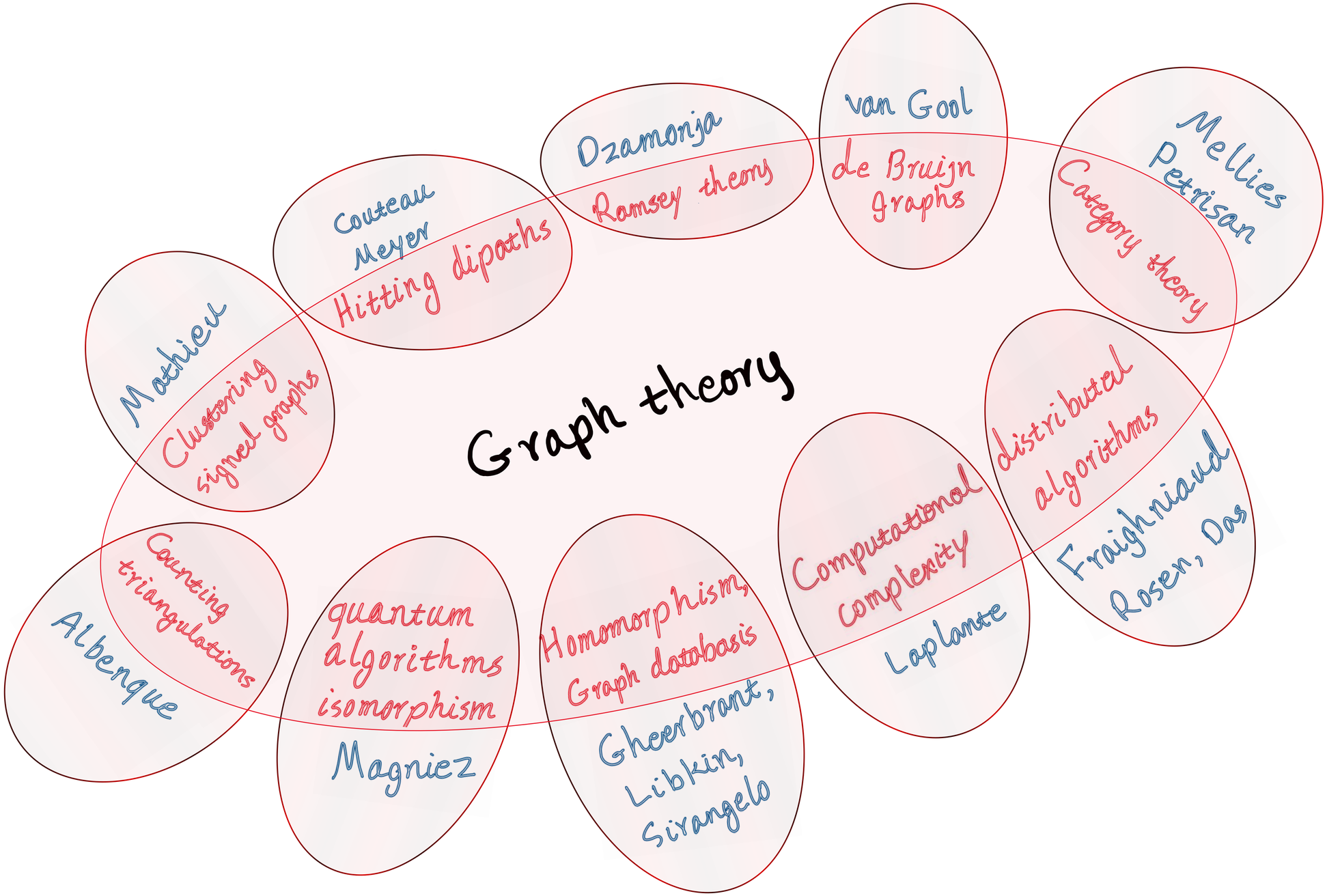


Theorem. If an oriented graph has no induced,  and  ,
then it admits a 2-dicoloring.

References.

P. Aboulker, G. Aubian, and P. Charbit. Decomposing and coloring some locally semicomplete digraphs. *European J. Comb. 106: 103591 (2022)*

R. Steiner. On coloring digraphs with forbidden induced subgraphs, J. Graph Theory, 103 (2022), 323-339


Graph theory
Dzamonja
Ramsey theory
van Gool
de Bruijn
Graphs
Mellies
Petrisan
Category theory
Couteau
Meyer
Hitting dipaths
Mathieu
Clustering
signed graphs
distributed
algorithms
Fraigniaud
Rosen, Das
Computational
complexity
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Graph database
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