

# Between Subgraph Isomorphism and Maximum Common Subgraph, How to make faster algorithms

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(This talk is based on joint work with Mun See Chang, Ciaran McCreesh and Craig Reilly.)

The subgraph isomorphism problem looks at finding a small pattern graph inside a larger target graph. Whereas when a small pattern graph does not occur inside a larger target graph, we can ask how to find “as much of the pattern as possible” inside the target graph. This is known as the maximum common subgraph problem.

We will look at the two different types of subgraph problems (and their variations), as well as talk about a restricted alternative [1] which asks if all but  $k$  vertices from the pattern can be found in the target graph.

Finally, we will look at ongoing research into making the algorithms involved in these problems faster by using a combination of homomorphisms, and subgraph homomorphism search to inform the original problem as to where the pattern graph will never occur in the target graph.

- [1] R. Hoffmann, C. McCreesh, C. Reilly. Between Subgraph Isomorphism and Maximum Common Subgraph *AAAI 2017*.