Paths in a Tree with Fixed Maximum Degree

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Intersection of Paths in a Tree

Subtree Overlap Graphs

Overlap of Paths in a Tree

Overlap of Paths in Degree-Limited Tree

Intersection of Paths in Degree-Limited Tree

Catepillar Overlap Graphs

Polygon Circle Graphs

Circle Graphs

Chordal Graphs

Interval Graphs

Circle Graphs

Chordal Graphs

Intersection of Paths in a Tree
Proof Intuition
Transformation

\[ G = (V, E) \]

\[ G' = (V' = V \cup E \cup H, \quad E' = \text{edges between:} \]

- members of \((E \cup H)\),
- member of \(V\) and its holder
- member of \(E\) and its endpoints in \(G\)

\begin{align*}
\text{holder of } u & \\
\text{holder of } v & \\
\text{holder of } w &
\end{align*}
If $G$ is $k$-colourable,
$G'$ is $k$-representable

$C_1 \quad C_2 \quad \ldots \quad C_k$
G’ is k-representable

- $E \cup H$ is a clique - their subtrees must have a node in common

Diagram:
- Nodes 1, 2, q
- Edge between 1 and q
- Edge between 2 and q
- Indicated that there are at most $k$ nodes in common
Claim: Adjacent vertices in G are not represented on the same branch
Claim: Adjacent vertices in $G$ are not represented on the same branch
at most \( k \)
at most $k$
Subtree Overlap Graphs

- Caterpillar Overlap Graphs
  - Polygon Circle Graphs
    - Circle Graphs
    - Chordal Graphs
      - Intersection of Paths in a Tree
        - Interval Graphs
        - Intersection of Paths in a Tree in Degree-Limited Tree
          - Overlap of Paths in a Tree
            - Overlap of Paths in Degree-Limited Tree
G is $k$-colourable

G’ is Intersection of Paths

G’ is Overlap of Paths

Overlap of Paths in Degree-Limited Tree

Intersection of Paths in Degree-Limited Tree
G is k-colourable

G' is Intersection of Paths

G' is J

G' is Overlap of Paths

Overlap of Paths in Degree-Limited Tree

Class J

Intersection of Paths in Degree-Limited Tree
Thanks

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