

Bubble Structures in Digraphs

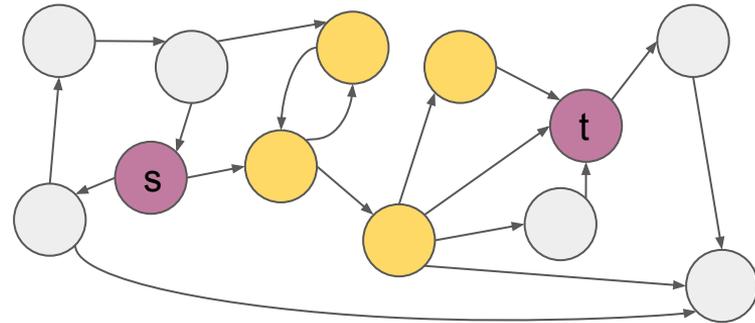
Lena Gladbach
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Masters student
Bioinformatik Uni Leipzig

16.02.2023
38th TBI Winterseminar in Bled

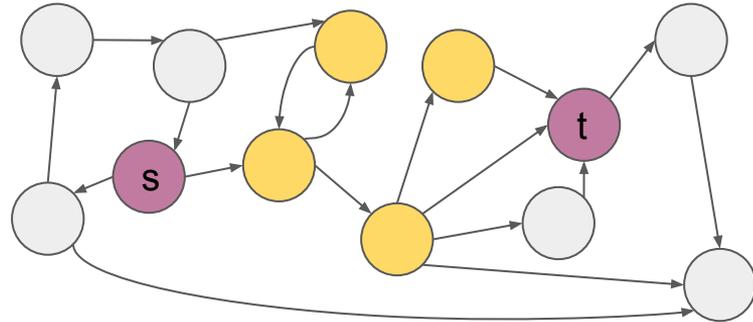
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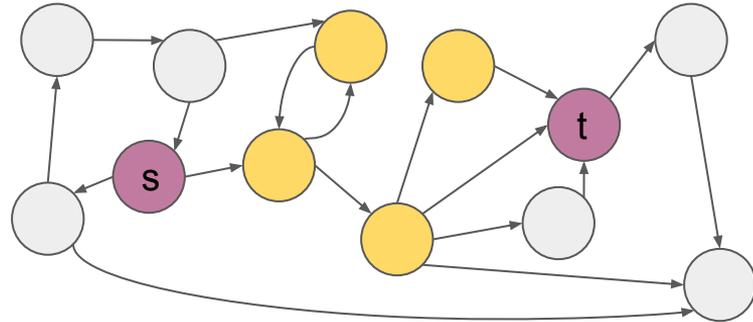


[Philip Göhler. Generalized bubbles in digraphs. 2021.]

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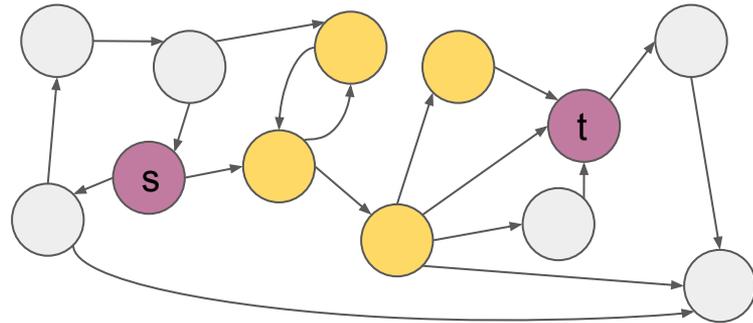
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We say that (s, A, t) is a **bubble** in G if for all $x \in A$ there is

a path from s to x in $\hat{G}[A]$ that does not pass through t and

a path from x to t in $\hat{G}[A]$ that does not pass through s .



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Properties of Bubbles

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Oriented Bubble if (u, A, v) is a bubble if and only if $u = s$ and $v = t$.

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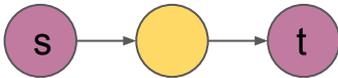
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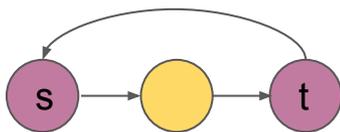
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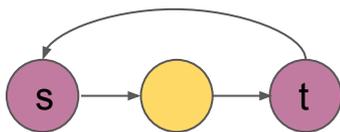
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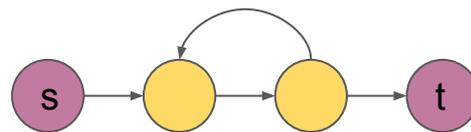
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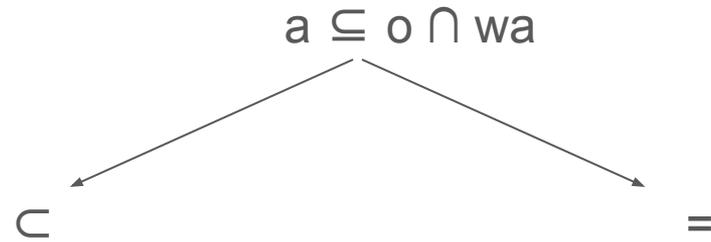
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Proof Idea

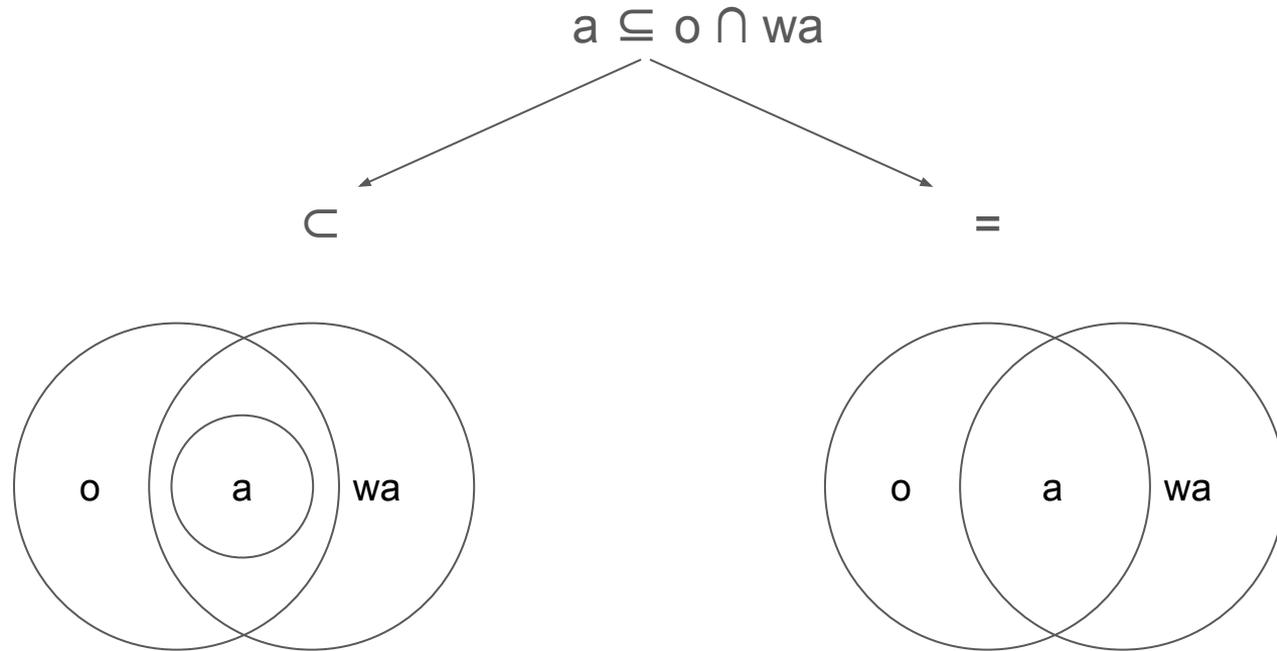
Proof Idea

$$a \subseteq o \cap wa$$

Proof Idea



Proof Idea



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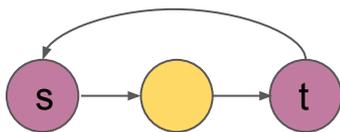
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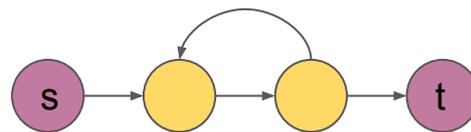
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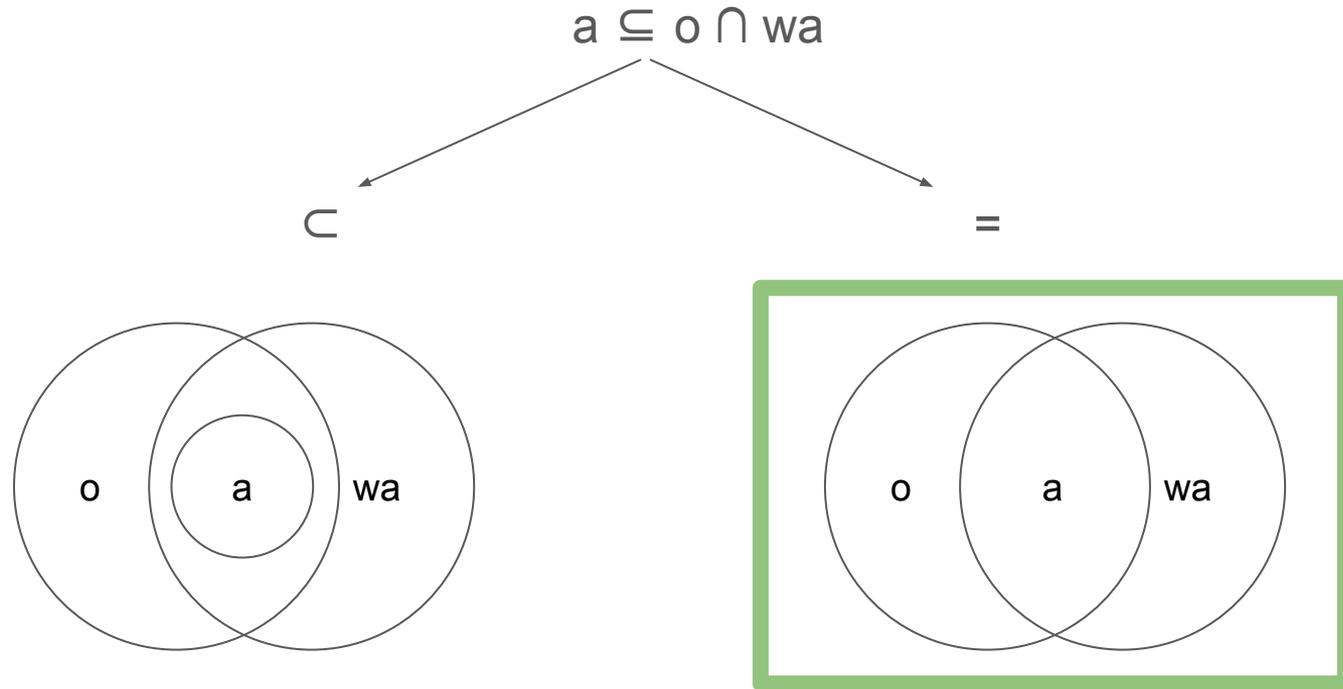


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Proof Idea



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- algorithmic approaches to find bubbles (with certain properties) efficiently

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**I am looking for a PhD position abroad in graph theory
starting September 2023 at the earliest :)**

Thank you for your attention!