

Path-based depth-first search for strong and biconnected components

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Outline

- 1 Introduction
- 2 Strong Components
 - Purdom and Munro's high-level algorithm
 - Contribution



Several Questions

- One-pass or two-pass?
- LOWPOINT?
- Ear decomposition?
- Compele version?
- Robbin's Theorem?



Questions

- "Equivalently the strong component graph is the acyclic digraph, formed by contracting vertices of G , that has an many vertices as possible." What is the meanings of this sentence?



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Pseudo-Code

```
1  H = G;  
2  while H still has a vertex v  
3      start a new path P = (v);  
4      while P is not empty  
5          if the last vertex of P has an edge (v_k, w)  
6              if w belongs to P  
7                  find v_i in P, which w and v_i are  
8                      identical;  
9                      contract the cycle v_i, ... , v_k, both in  
10                         H and in P;  
11          else  
12              add w to P, as the new last vertex of P;  
13          end if
```



Pseudo-Code (Continue.)

```
12     else
13         output v_k as a vertex of the strong component
           graph;
14         { * v_k may be a set of multiple vetices in the
           original graph *}
15     end if
16 end
17 end
```



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His Contribution

- He gave a simple list-based implementation that achieves linear time.



Summary

- The **first main message** of your talk in one or two lines.
- The **second main message** of your talk in one or two lines.
- Perhaps a **third message**, but not more than that.
- Outlook
 - Something you haven't solved.
 - Something else you haven't solved.



For Further Reading I



A. Author.

Handbook of Everything.

Some Press, 1990.



S. Someone.

On this and that.

Journal of This and That, 2(1):50–100, 2000.

