

Computing the Refined Process Structure Tree of a Workflow Net

Seminar:
Selected topics in
Process and Data Science

Dimitri Rusin

6th July 2018

OVERVIEW

Goal

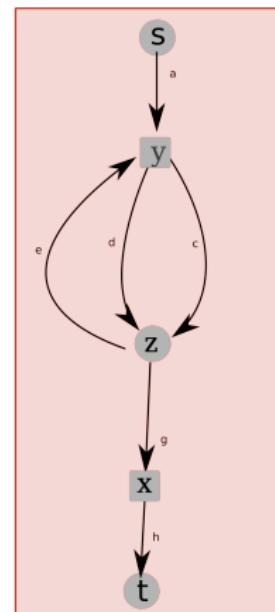
Preprocessing: Node Duplicating

Decomposition: SPQR Tree

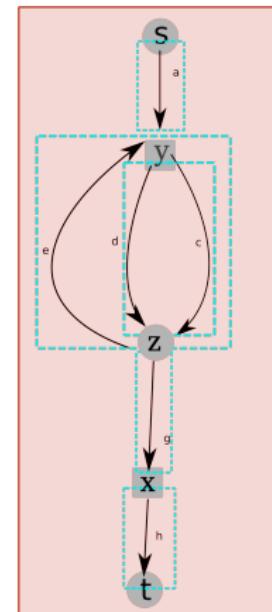
Postprocessing: RPST

WHAT WE WANT

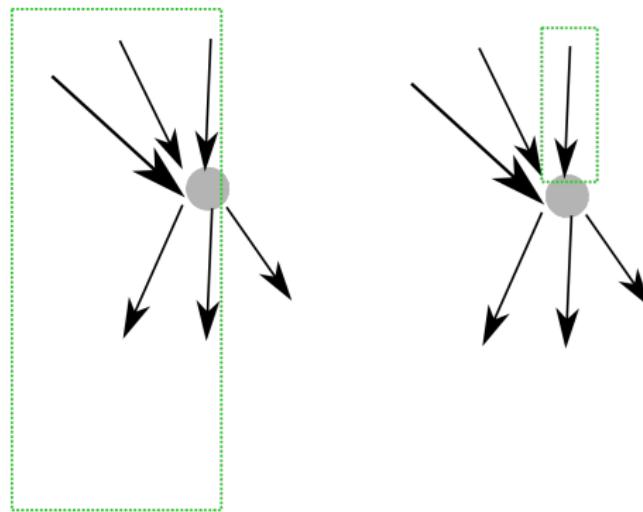
Workflow Net



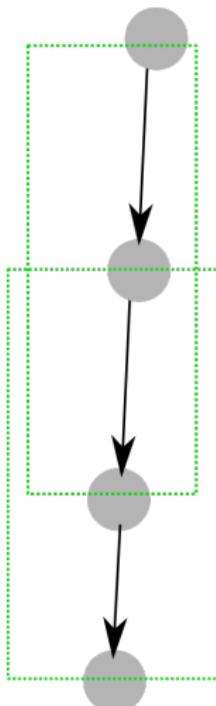
RPST



SINGLE-ENTRY SINGLE-EXIT COMPONENT (SESE)



CANONICAL SESE



OVERVIEW

Goal

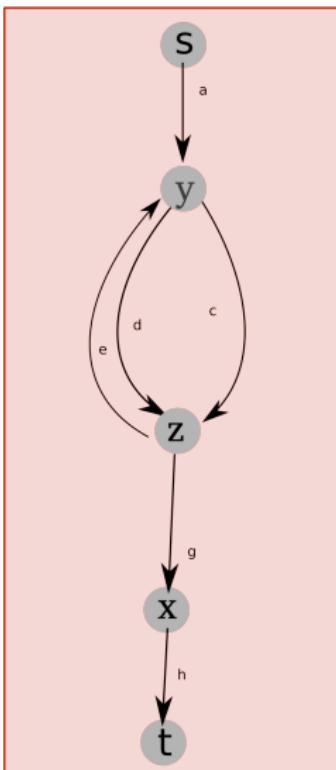
Preprocessing: Node Duplicating

Decomposition: SPQR Tree

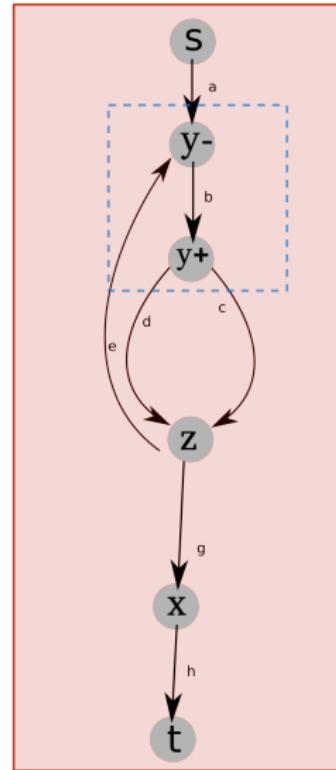
Postprocessing: RPST

PREPROCESSING: NODE DUPLICATING

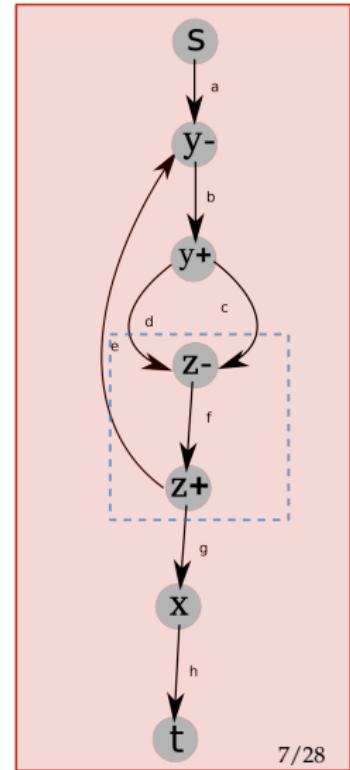
State 0



State 1



State 2



OVERVIEW

Goal

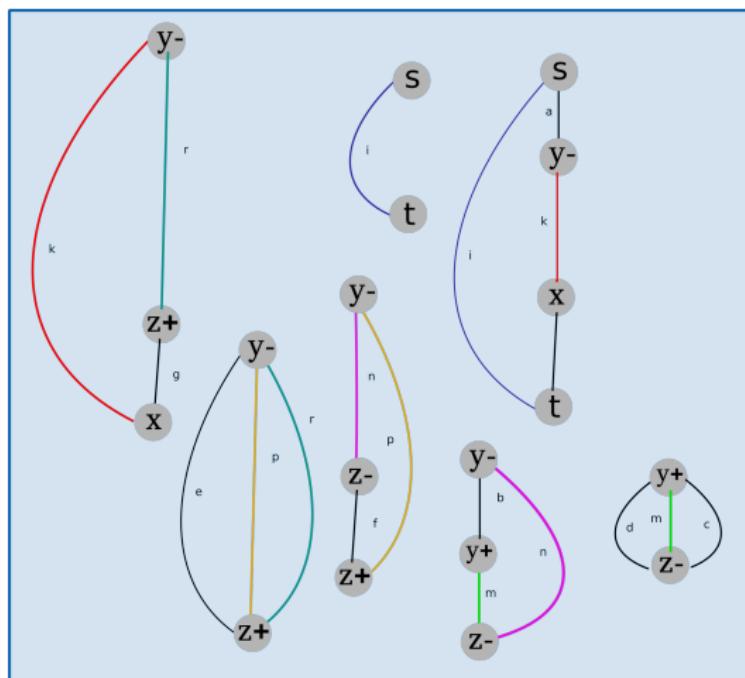
Preprocessing: Node Duplicating

Decomposition: SPQR Tree

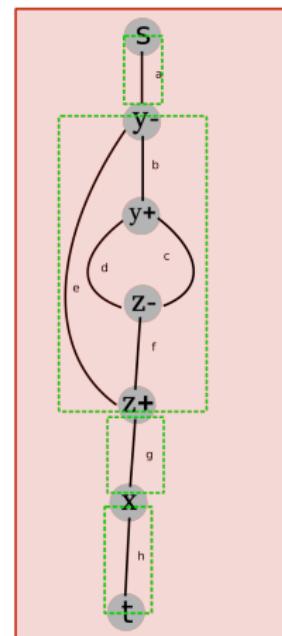
Postprocessing: RPST

Two Kinds of Decompositions

"Virtual" Decomposition

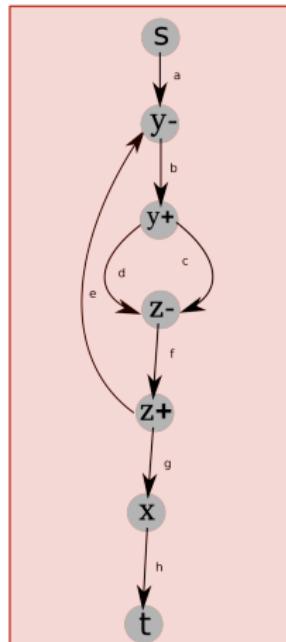


"Real" Decomposition

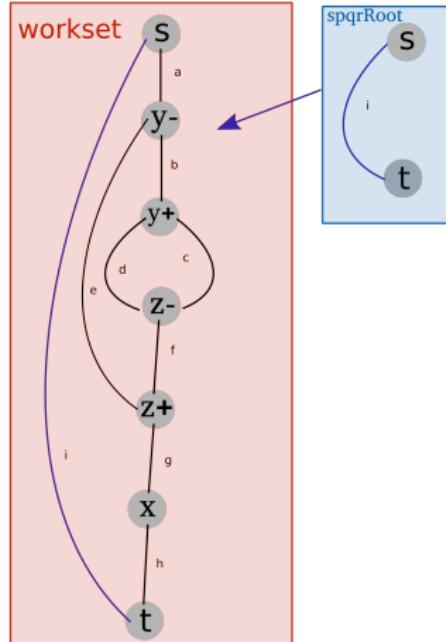


SPQR TREE (0/5)

Pre-Loop

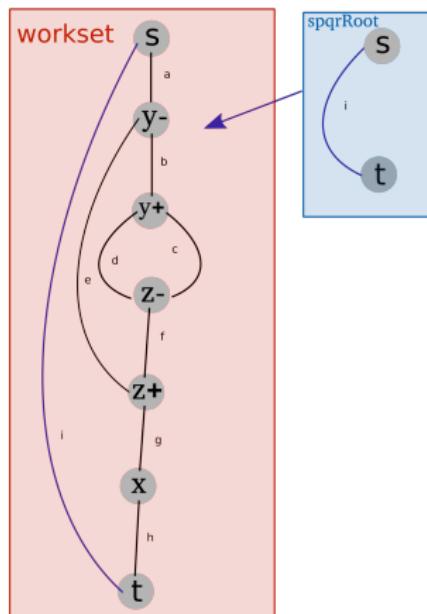


State 0

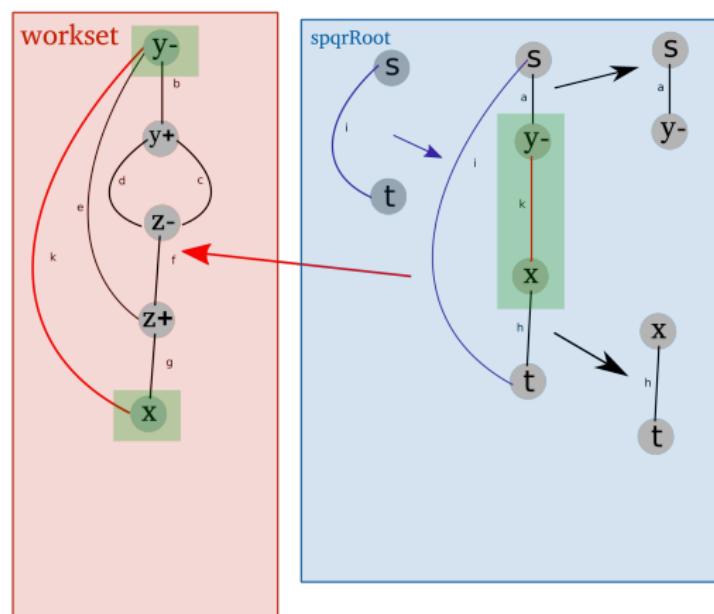


SPQR TREE (1/5)

State 0

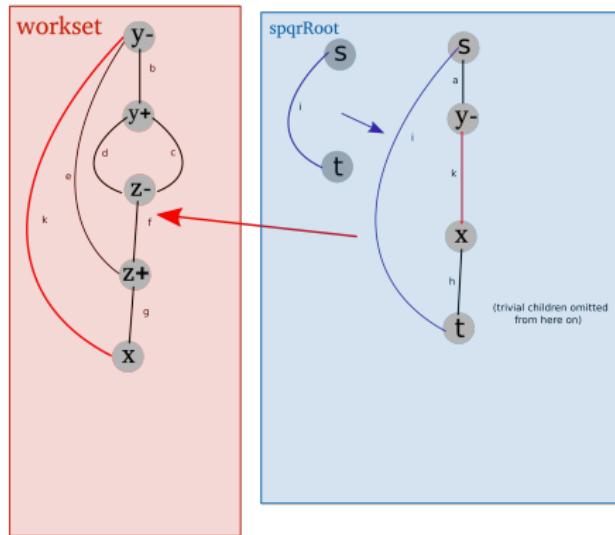


State 1

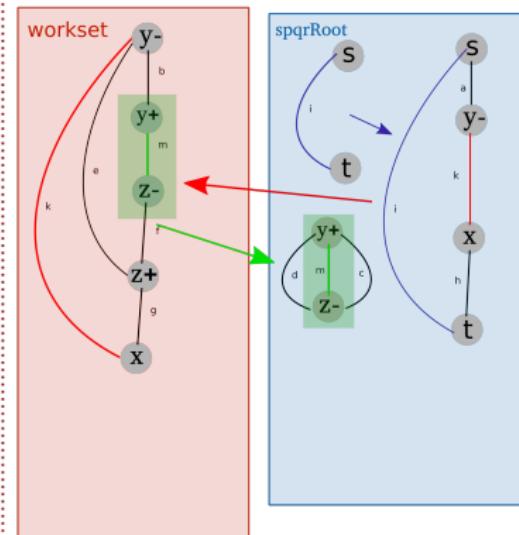


SPQR TREE (2/5)

State 1

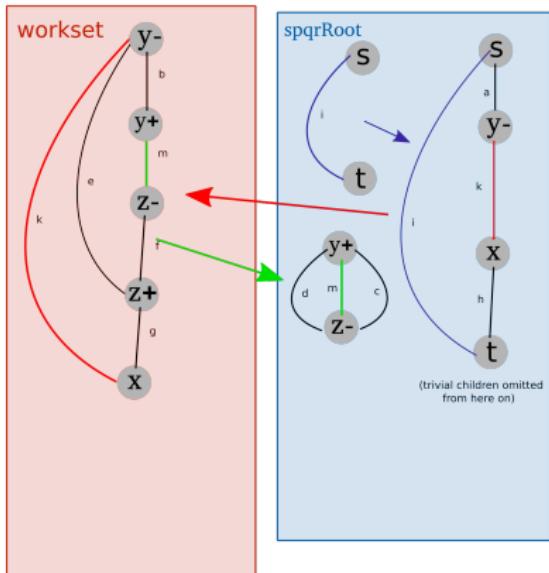


State 2

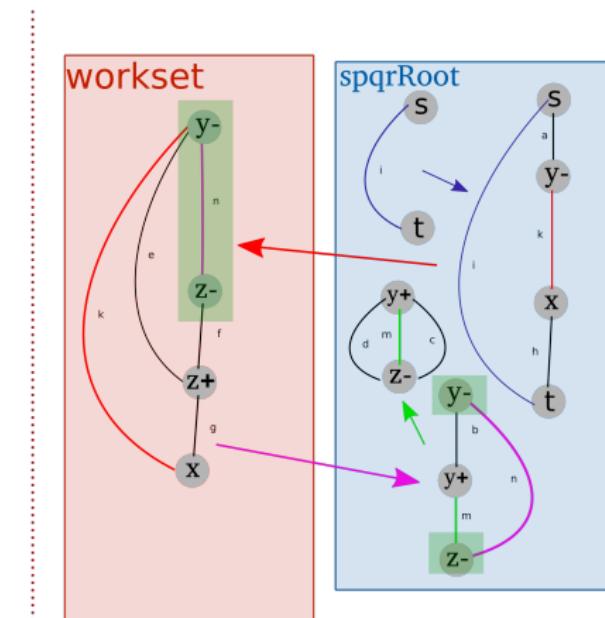


SPQR TREE (3/5)

State 2

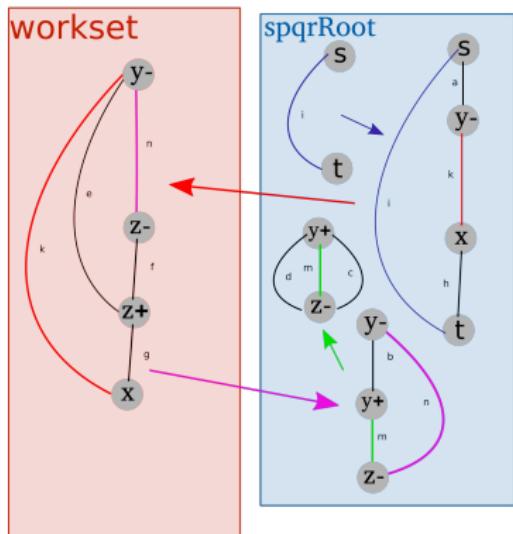


State 3

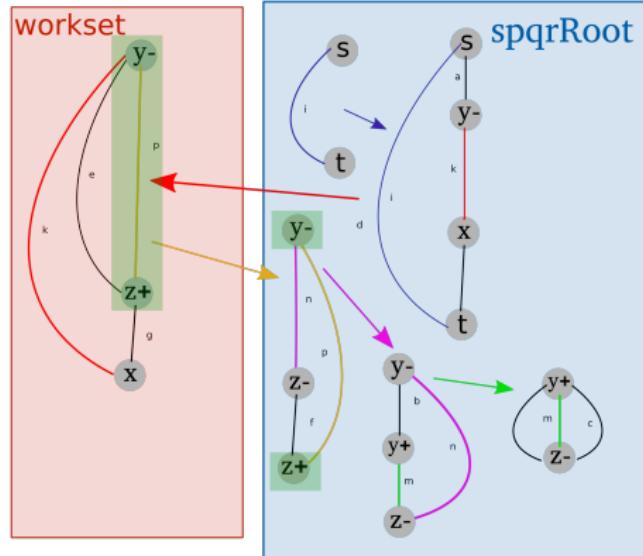


SPQR TREE (4/5)

State 3

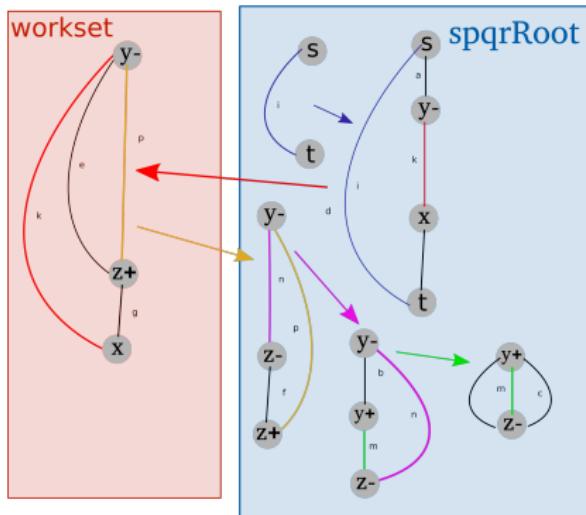


State 4

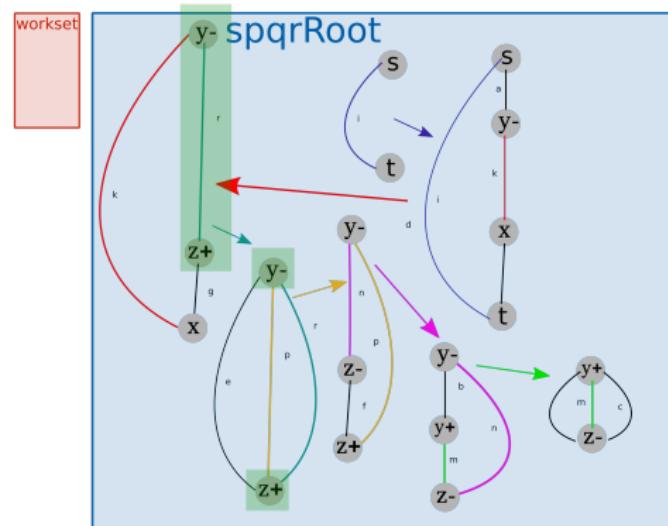


SPQR Tree (5/5)

State 4



State 5



OVERVIEW

Goal

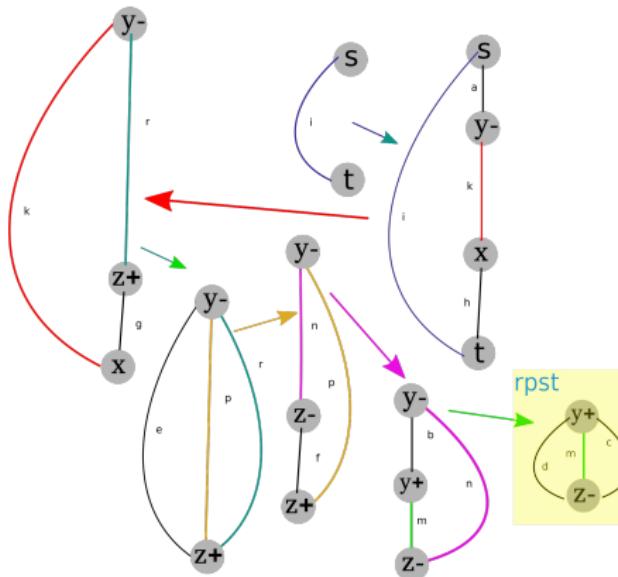
Preprocessing: Node Duplicating

Decomposition: SPQR Tree

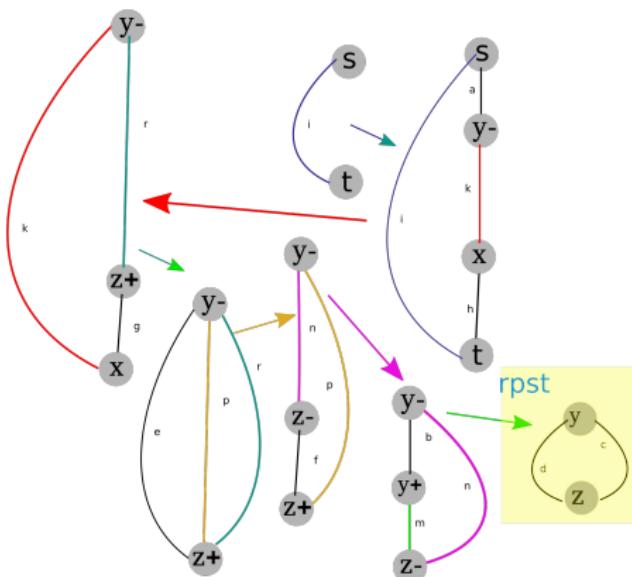
Postprocessing: RPST

RPST (1/7)

State 0

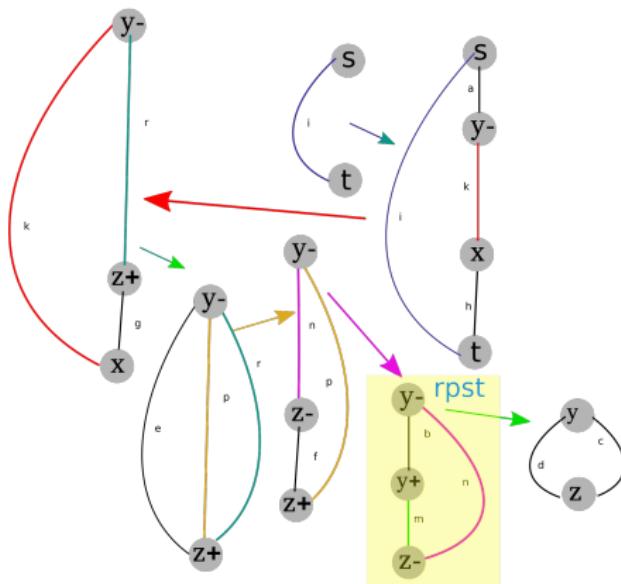


State 1

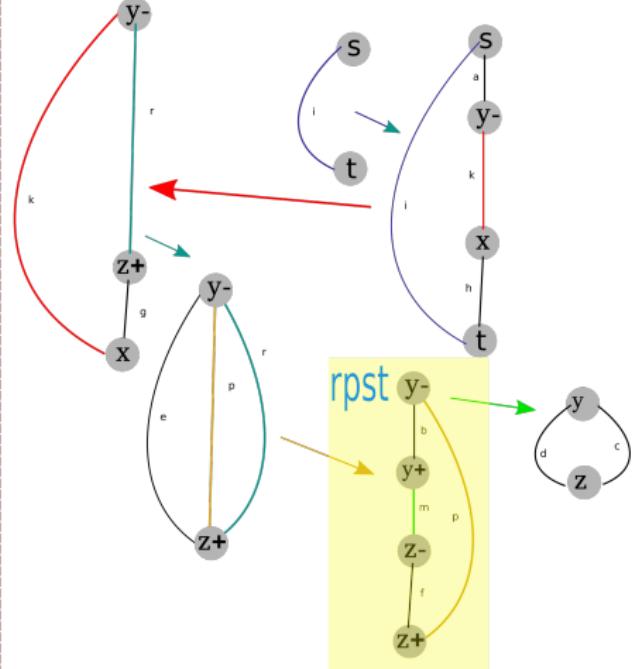


RPST (2/7)

State 1

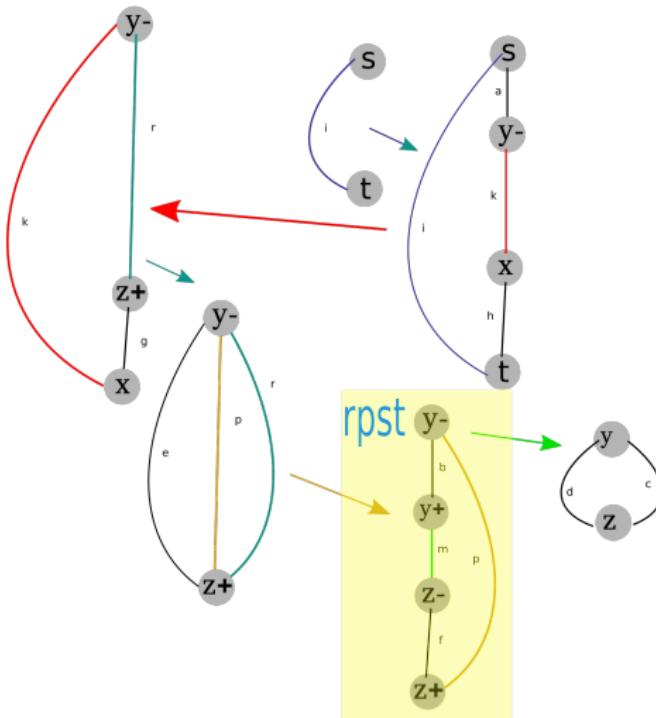


State 2

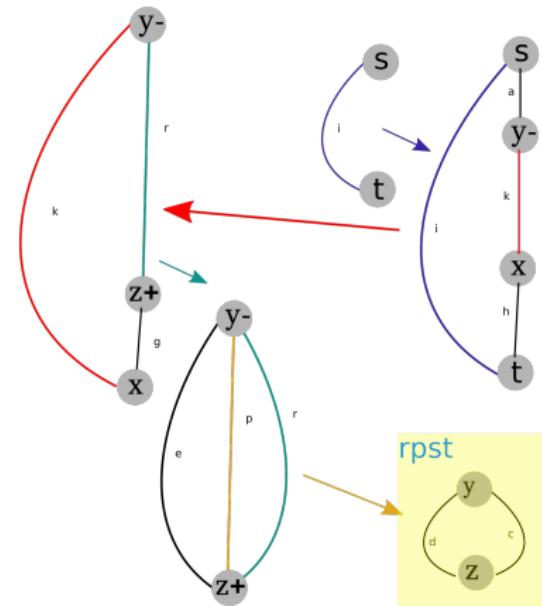


RPST (3/7)

State 2

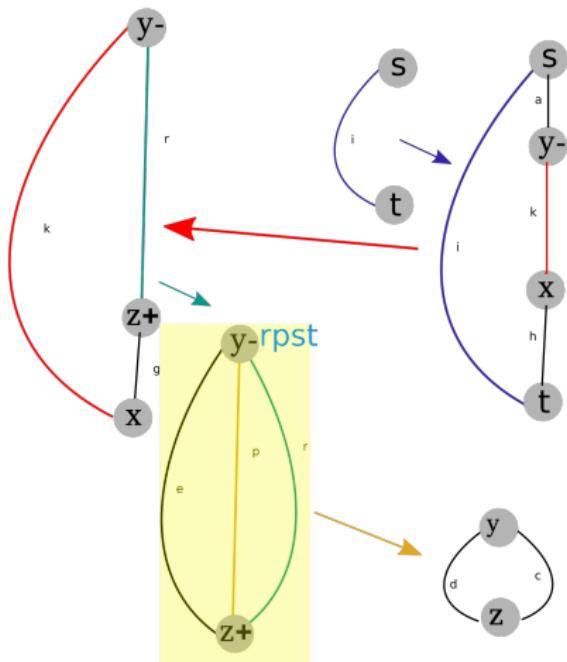


State 3

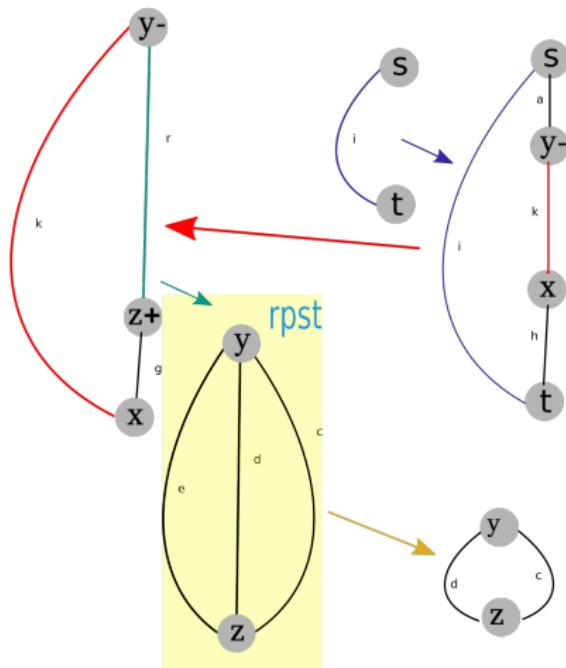


RPST (4/7)

State 3

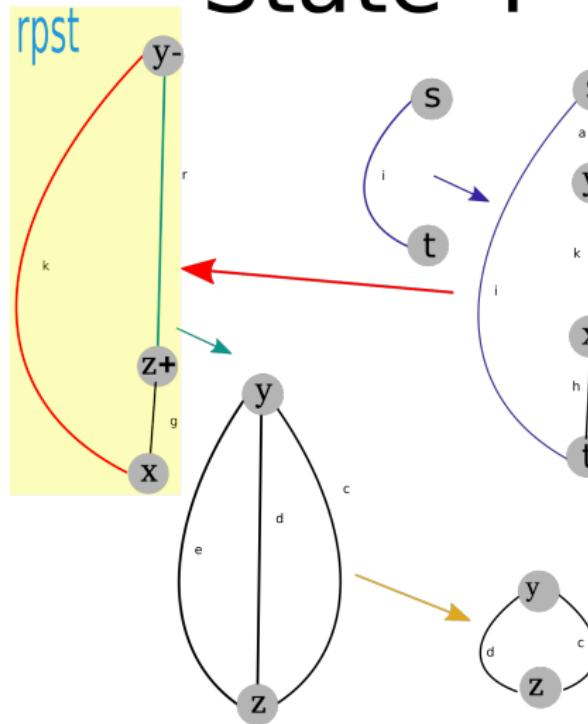


State 4

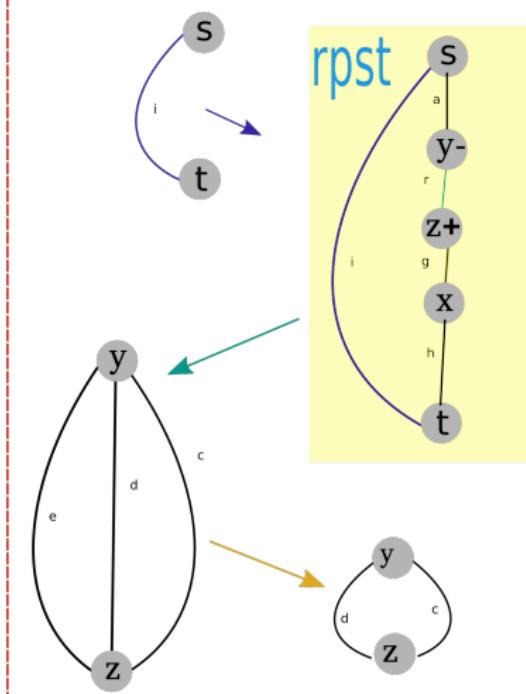


RPST (5/7)

State 4

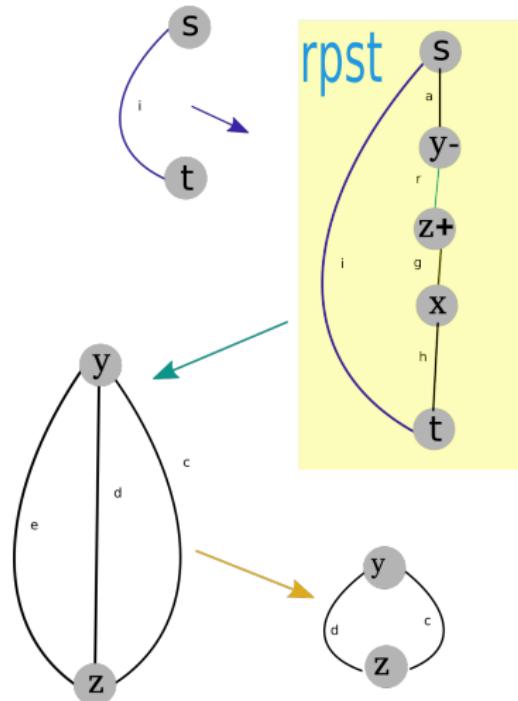


State 5

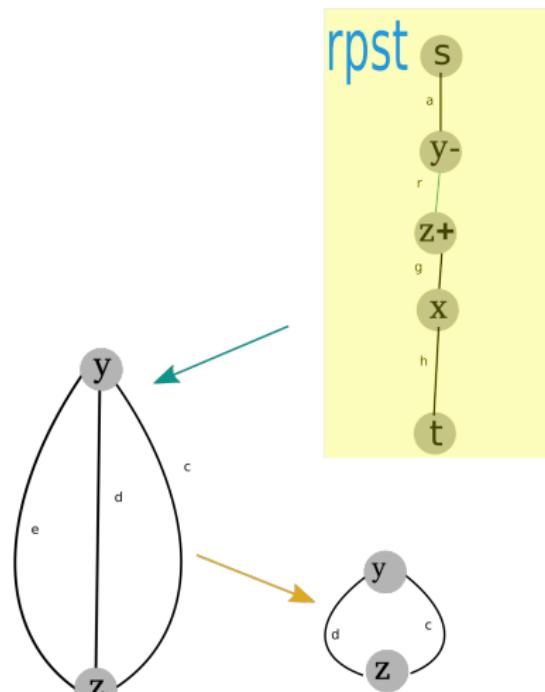


RPST (6/7)

State 5

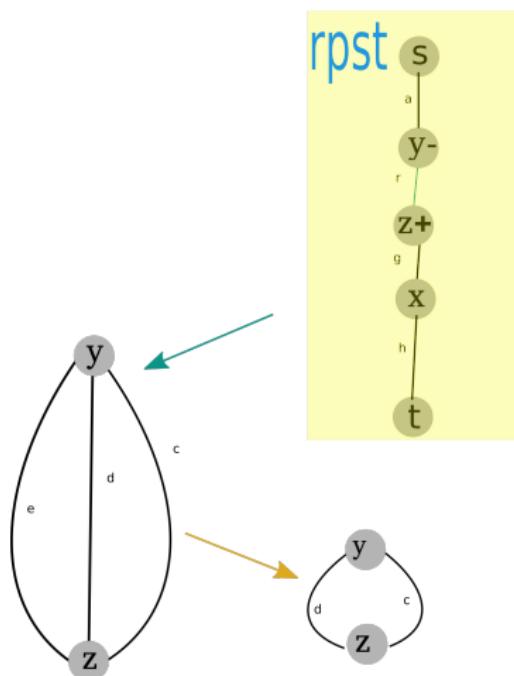


State 6

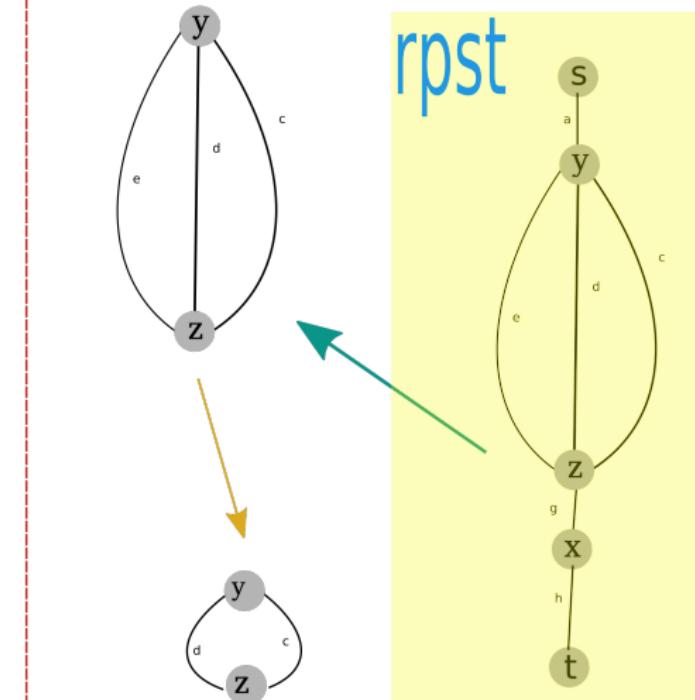


RPST (7/7)

State 6

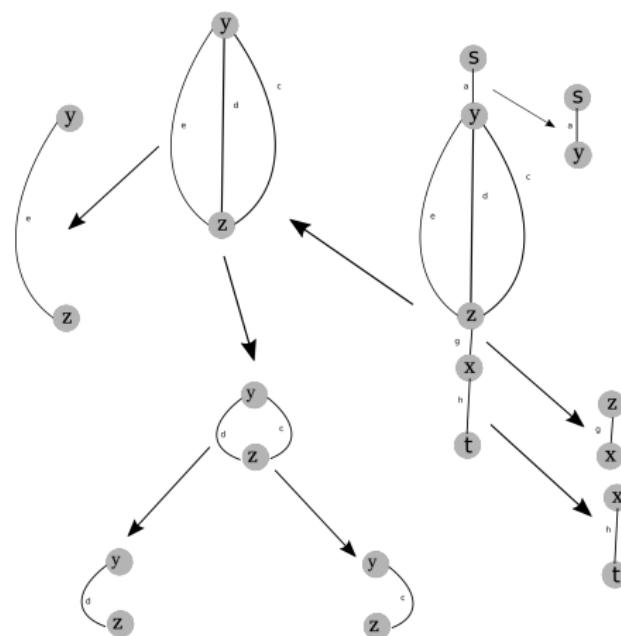


State 7

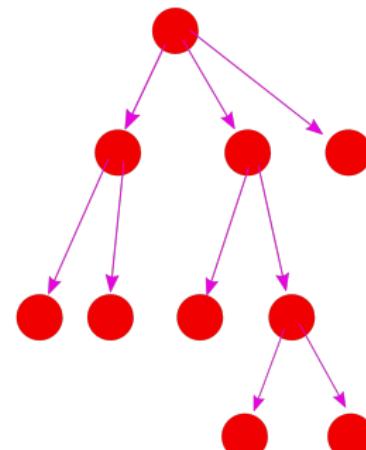


ARBITRARY RPST

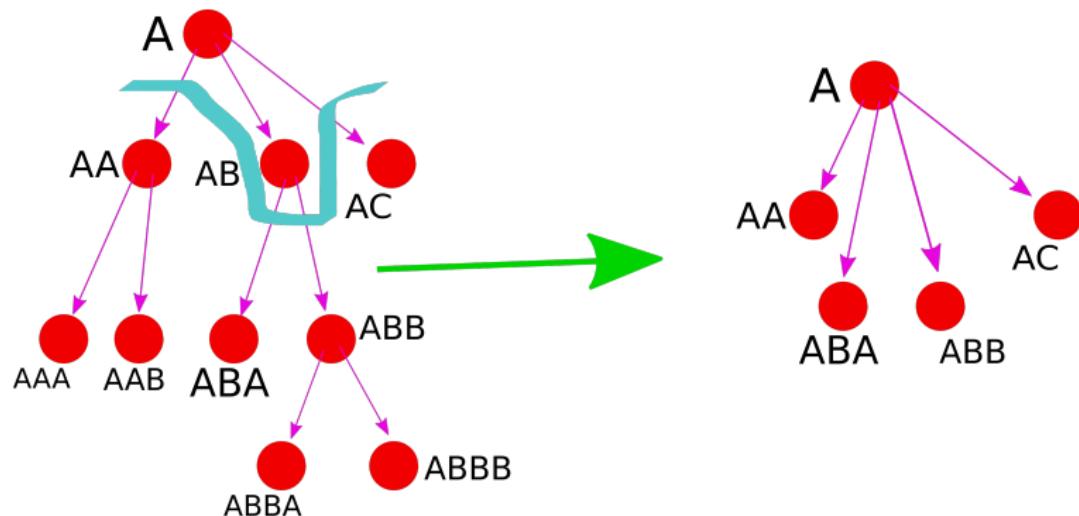
Concrete



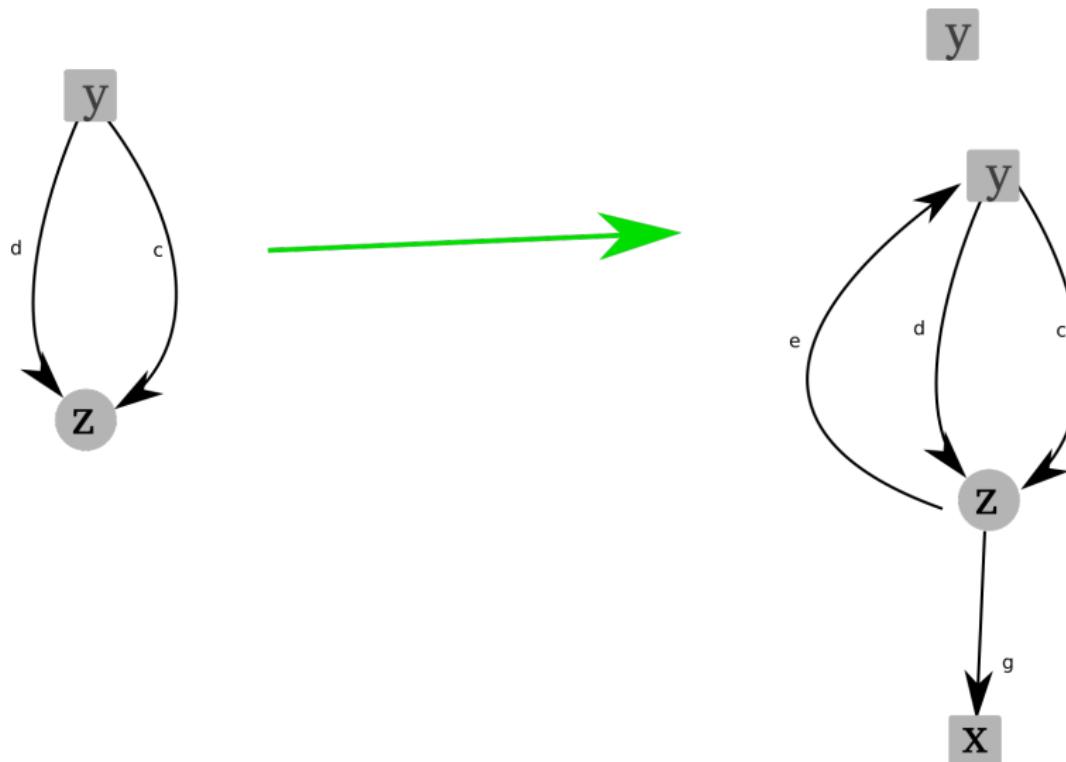
Abstract



TRANSVERSE CUT

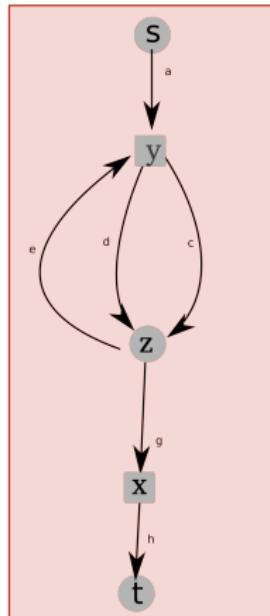


BRIDGING TO ELIMINATE PLACE BOUNDARIES

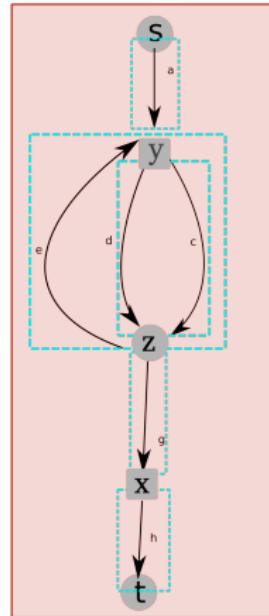


RESULT

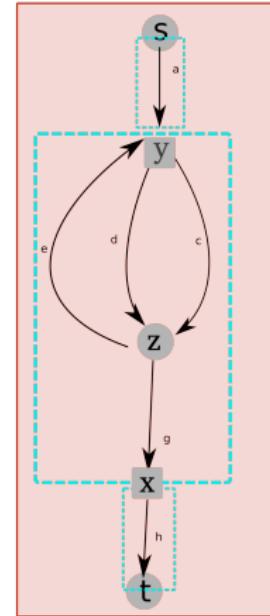
Workflow Net



RPST



The Only Bridged
SESE Decomposition



THANK YOU!

Thank you for your attention!