technische universität dortmund

Abschlusspräsentation Projekt 2

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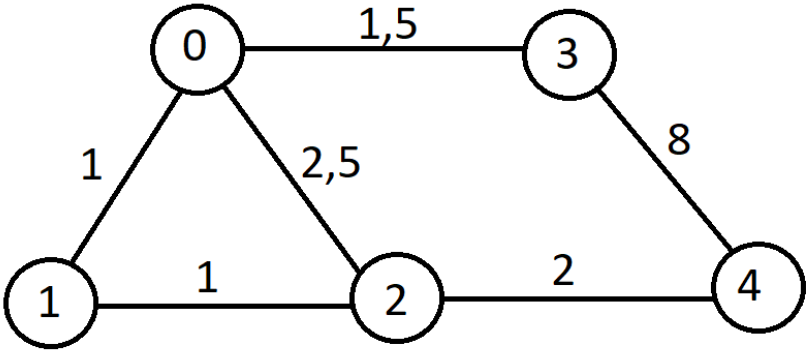
TU Dortmund - Fachprojekt zu "Routingalgorithmen"

Kai

Die Topologie



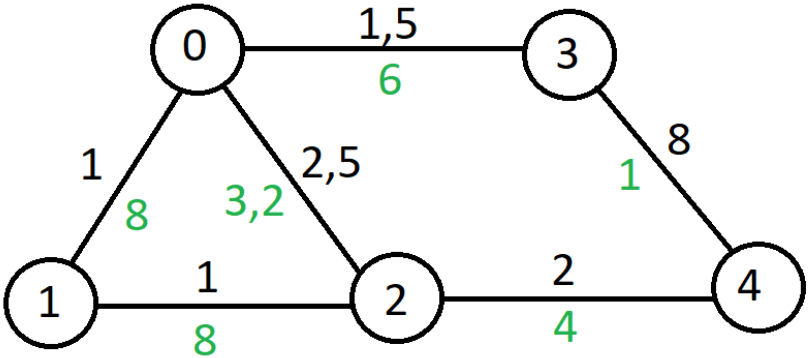
Capacity

InverseCap.

ClosenessInvCap.

ClosenessCentr.

Inverse Capacity



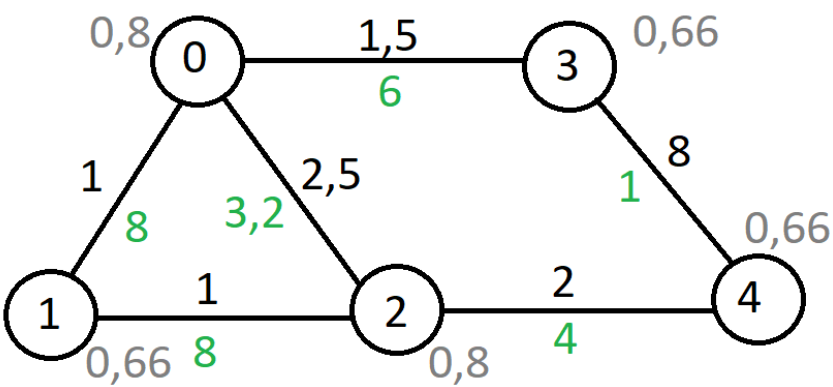
Capacity

InverseCap.

ClosenessInvCap.

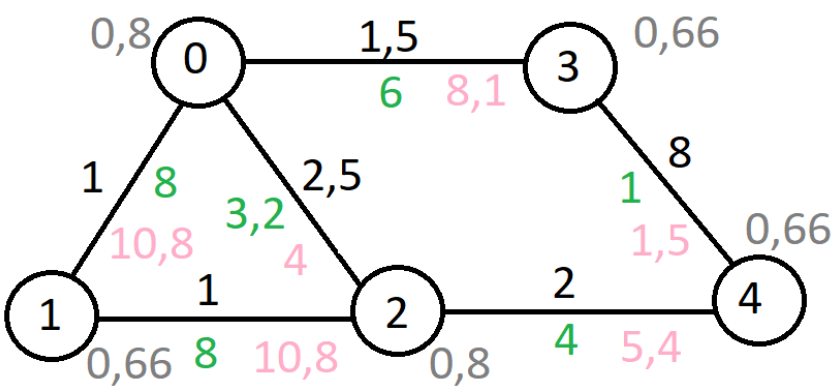
ClosenessCentr.

Closeness Centrality Werte



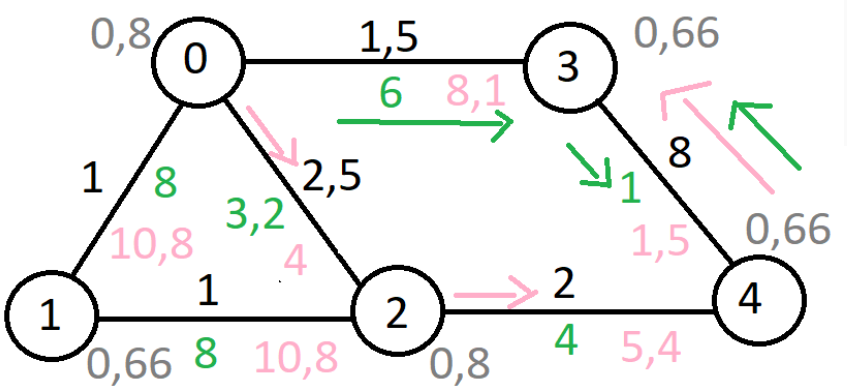
Capacity
InverseCap.
ClosenessInvCap.
ClosenessCentr.

Closeness Centrality With Inverse Capacity



Capacity
InverseCap.
ClosenessInvCap.
ClosenessCentr.

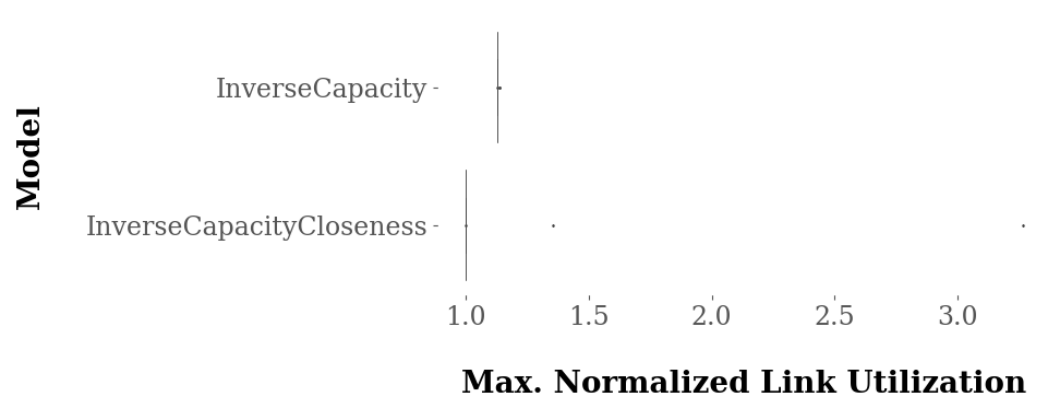
Mit Demands



Capacity
InverseCap.
ClosenessInvCap.
ClosenessCentr.

Demands von 0 nach 4 (eine Capacity-Einheit)
und von 4 nach 3 (acht Capacity-Einheiten)

Boxplots

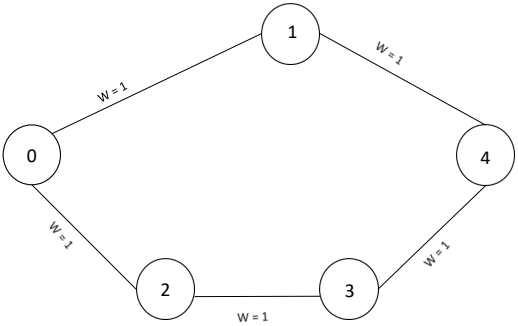

Model
InverseCapacity
InverseCapacityCloseness
1.0
1.5
2.0
2.5
3.0
Max. Normalized Link Utilization

Ist meine Algorithmus besser?

- in diesem speziellen Setting: Ja
- ”designed” Topologie
  $\rightarrow$ lange Suche nach guter Topologie für den Algorithmus
- Siehe Projekt 1: *Inverse_Capacity* im Durchschnitt besser als meine Anpassung

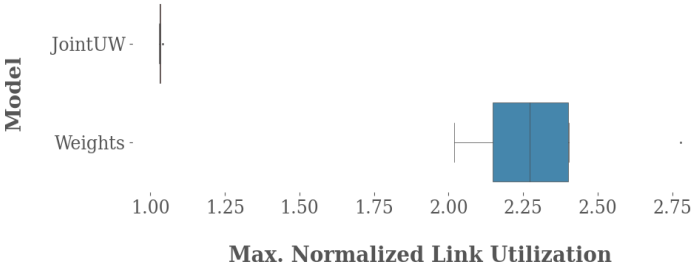
Naveed

Topologie:



Ergebnisse

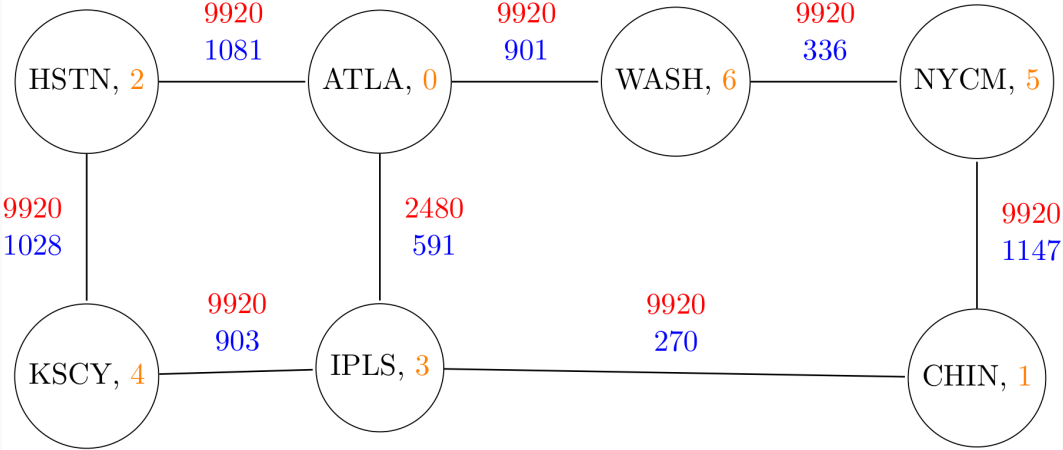
```
100 ; SimpleJointUW.topo.sh ; 1.030732232
101 ; Weights.topo.sh ; 2.27279644
102 ; SimpleJointUW.topo.sh ; 1.029772264
103 ; Weights.topo.sh ; 2.2709963626666667
104 ; SimpleJointUW.topo.sh ; 1.04189532
105 ; Weights.topo.sh ; 2.018401589333333
106 ; SimpleJointUW.topo.sh ; 1.0294664186666667
107 ; Weights.topo.sh ; 2.2703404586666664
100 ; SimpleJointUW.topo.sh ; 1.03383732
101 ; Weights.topo.sh ; 2.2745359973333334
102 ; SimpleJointUW.topo.sh ; 1.0317545653333333
103 ; Weights.topo.sh ; 2.1461416213333333
104 ; SimpleJointUW.topo.sh ; 1.0336421573333334
105 ; Weights.topo.sh ; 2.399926333333333
106 ; SimpleJointUW.topo.sh ; 1.0312037733333332
107 ; Weights.topo.sh ; 2.402300864
100 ; SimpleJointUW.topo.sh ; 1.0311207813333334
101 ; Weights.topo.sh ; 2.1489939546666665
102 ; SimpleJointUW.topo.sh ; 1.033397992
103 ; Weights.topo.sh ; 2.021706978666667
104 ; SimpleJointUW.topo.sh ; 1.0328527973333332
105 ; Weights.topo.sh ; 2.404023616
106 ; SimpleJointUW.topo.sh ; 1.0313898426666666
107 ; Weights.topo.sh ; 2.7790064053333334
```




```
100_SimpleJointUW.topo.sh  107_Weights.topo.sh  joint.json        nanonet-master
101_Weights.topo.sh        addr.py              Joint.topo.py     net.py
102_SimpleJointUW.topo.sh  batch_result001.csv  Joint.topo.sh     node.py
103_Weights.topo.sh        build.py             jointUW.json      __pycache__
104_SimpleJointUW.topo.sh  Figure_1.png         JointUW.topo.py   README.md
105_Weights.topo.sh        gen_boxplot.py       json              route.py
106_SimpleJointUW.topo.sh  imgs                 nanonet_batch.py  SimpleJointUW.
(base) linuxmint@linuxmint203:~/naveed$ sudo python3 gen_boxplot.py
JOINTUW Median:  1.031572204
WEIGHTS Median:  2.2718964013333336
JOINTUW Minimum:  1.0294664186666667
WEIGHTS Minimum:  2.018401589333333
JOINTUW Maximum:  1.04189532
WEIGHTS Maximum:  2.7790064053333334
(base) linuxmint@linuxmint203:~/naveed$
```

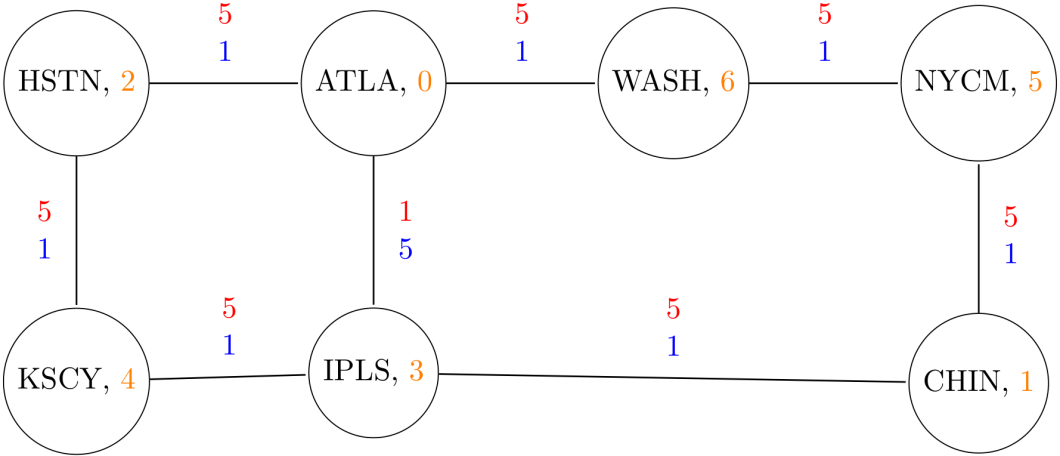
Sequential Combination aus InverseCapacity und DemandFirstWaypoints

Netzwerktopologie (Anlehnung an Abilene)[1]



[1] FaPro_P2/pouria/network_origin.pdf

Anwendung von InverseCapacity[2]



[2] FaPro_P2/pouria/network_origin.pdf

Demandtabelle (vereinfacht)[3]

↓ von, nach →	HSTN	KSCY	ATLA	IPLS	CHIN	WASH	NYCM
HSTN		1	13	2	6	8	3
KSCY	1		1	2	4	2	2
ATLA	28	1		5	3	19	4
IPLS	7	2	4		14	7	9
CHIN	165	17	18	7		11	12
WASH	13	5	13	5	17		20
NYCM	16	3	9	4	61	24	

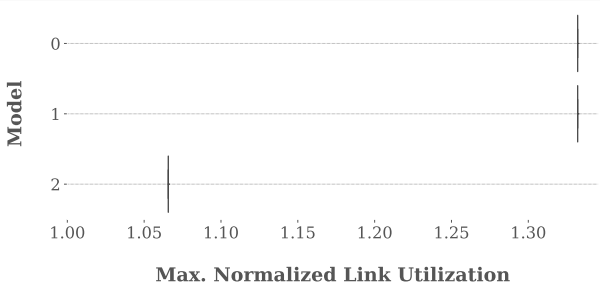
[3] FaPro_P2/pouria/network_origin.pdf

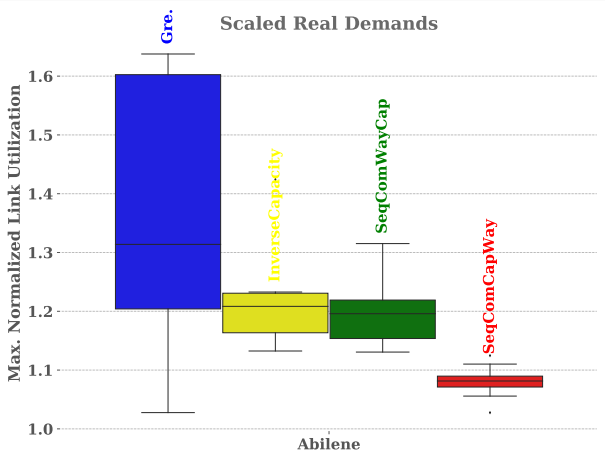
Demandtabelle (stärker vereinfacht)[4]

↓ von, nach →	HSTN	KSCY	ATLA	IPLS	CHIN	WASH	NYCM
HSTN							
KSCY							
ATLA				5			
IPLS						7	
CHIN							
WASH							
NYCM							

[4] FaPro_P2/pouria/network_origin.pdf

Resultierender Boxplot





Probleme

- keine Boxen:
  $\rightarrow$ vermutlich zu schwacher Rechner (2 Minuten Timeout reicht nicht)
- Sequential Combination besser:
  $\rightarrow$ meine Topolgie wurde vereinfacht, von Grund auf (.json$\rightarrow$.topo.py$\rightarrow$.topo.sh)
  $\rightarrow$ Joint/Weights evtl nicht

Ergebnisse Reproduktion

Daniel

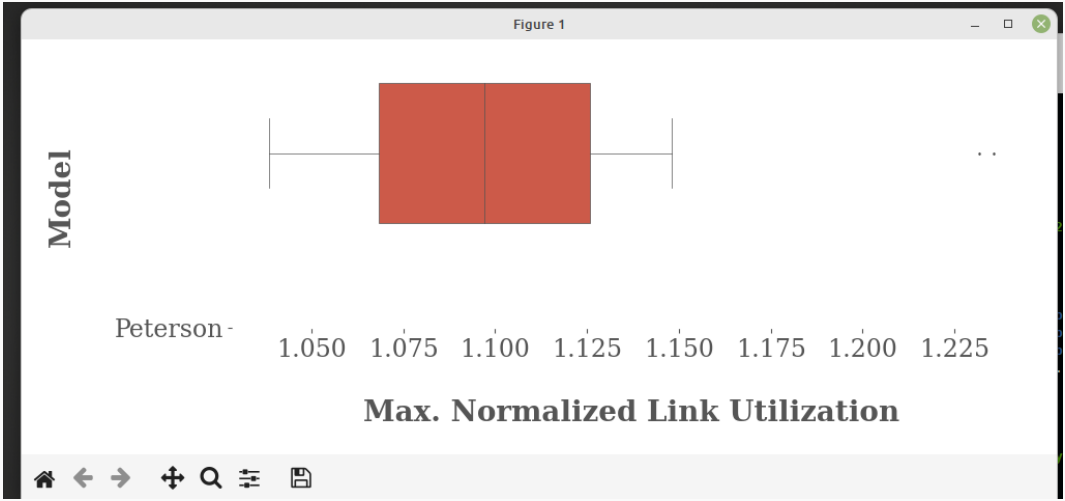


Figure 1
Model
Peterson
1.050
1.075
1.100
1.125
1.150
1.175
1.200
1.225
Max. Normalized Link Utilization

Daniel

batch_result001.csv U

repli > batch_result001.csv

```
130 ; Peterson.topo.sh ; 1.3226666666666667e-06
131 ; Peterson.topo.sh ; 1.3226666666666667e-06
132 ; Peterson.topo.sh ; 1.3226666666666667e-06
```

Zixiang Gu

```
12.throughput.json  2.throughput.json   averageweighted.topo.py  flow_0-4.txt          flow_13-4.t
13.throughput.json  3.throughput.json   averageweighted.topo.sh  flow_11-4.txt         flow_1-3.tx
(base) linuxmint@linuxmint203:~/FPRouting2/testbench$ sudo python3 gen_boxplot.py
JOINT Median:  1.0137915706666667
average Median:  0.988982292
JOINT Minimum:  1.0137913413333333
average Minimum:  0.9689171573333333
JOINT Maximum:  1.0138813386666667
average Maximum:  1.5211524506666667
(base) linuxmint@linuxmint203:~/FPRouting2/testbench$
```

S

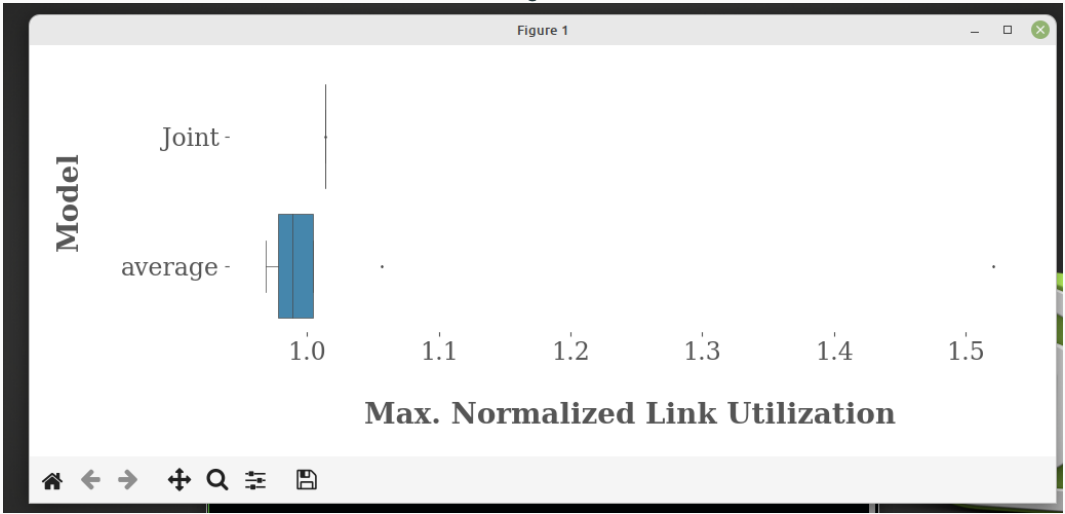


Figure 1
Model
Joint
average
1.0
1.1
1.2
1.3
1.4
1.5
Max. Normalized Link Utilization

```
(base) linuxmint@linuxmint203:~/FPRouting2/testbench$ ls
4.throughput.json     averageweighted.topo.py  Figure_1.png    joint.json     nanonet_batch.py  throughput.py
averageweighted.json  averageweighted.topo.sh  gen_boxplot.py  Joint.topo.sh  readme.md
(base) linuxmint@linuxmint203:~/FPRouting2/testbench$ chmod +x throughput.py
(base) linuxmint@linuxmint203:~/FPRouting2/testbench$ chmod +x averageweighted.topo.sh
(base) linuxmint@linuxmint203:~/FPRouting2/testbench$ python3 nanonet_batch.py

Create test case 100_averageweighted.topo.sh
Start script averageweighted.topo.sh
Process test 100 returned with 0.
Test should be finished ...
Stop script averageweighted.topo.sh
Process test 100 STOP returned with 1.
0 1
1 0
1 2
2 1
2 3
3 2
0 4
4 0
1 4
4 1
2 4
4 2
1 3
Traceback (most recent call last):
  File "/home/linuxmint/FPRouting2/testbench/nanonet_batch.py", line 179, in <module>
```

Fragen oder Anmerkungen?