

Area segmentation algorithms – A geoinformatic approach to Geomarketing strategies

Master Thesis in cooperation with
microm Micromarketing-Systeme und Consult GmbH

Agenda

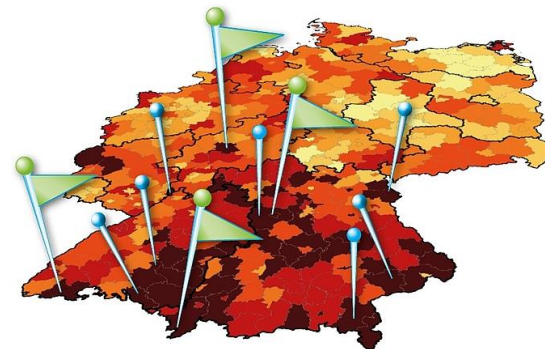
1. Introduction Geomarketing
2. Motivation and Research Question
3. Approach
4. Architecture
5. Progress
6. Outlook



[2]

Introduction Geomarketing

Connection of information in a spatial way to support marketing decisions of companies



[1]

Karte Standort
Standortanalyse

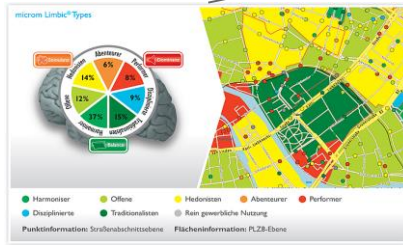
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[3]

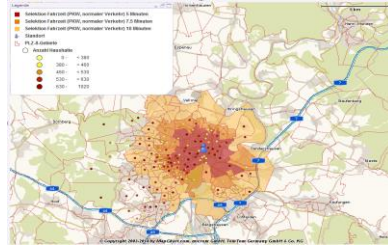
Introduction Geomarketing

Geomarketing



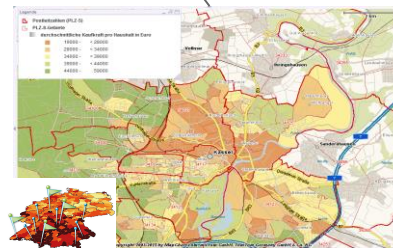
Analysis of
Audience

[1]



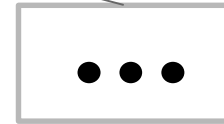
Catchment Areas

[1]



Location Planning

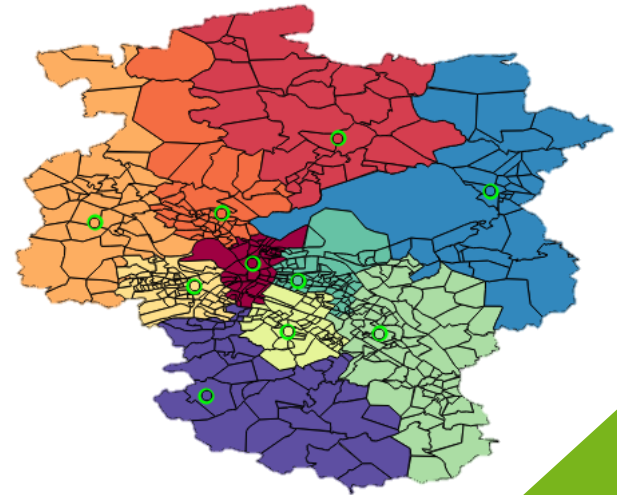
[1]



Routing,
Competition
observation,
...

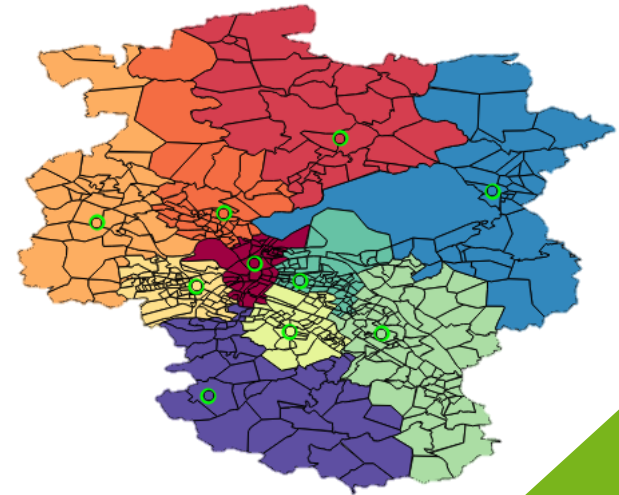
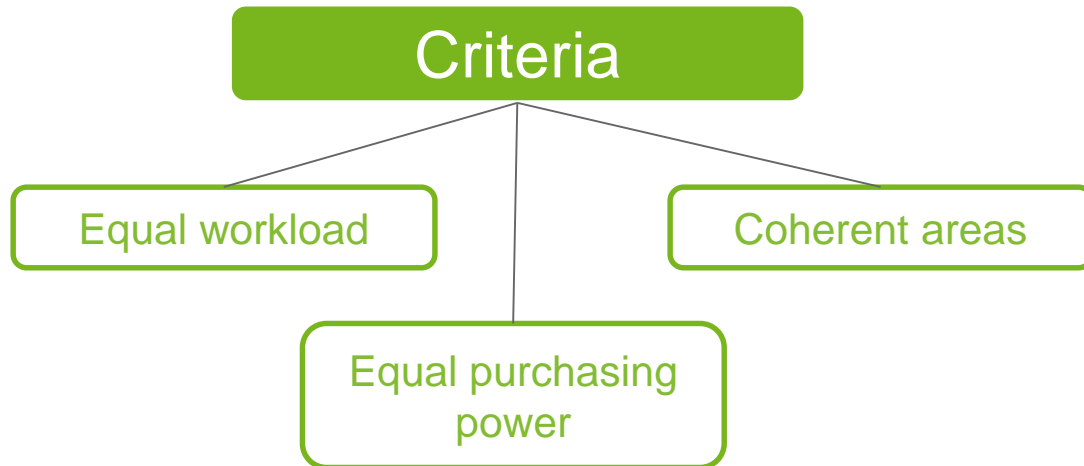
Use Case – Planning Marketing and sale areas

As a company owner I would like to plan marketing and sale areas for my employees to define areas of responsibility while considering predefined criterias.



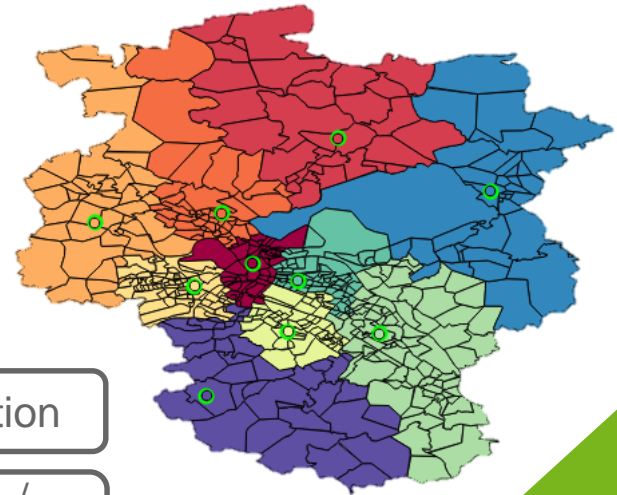
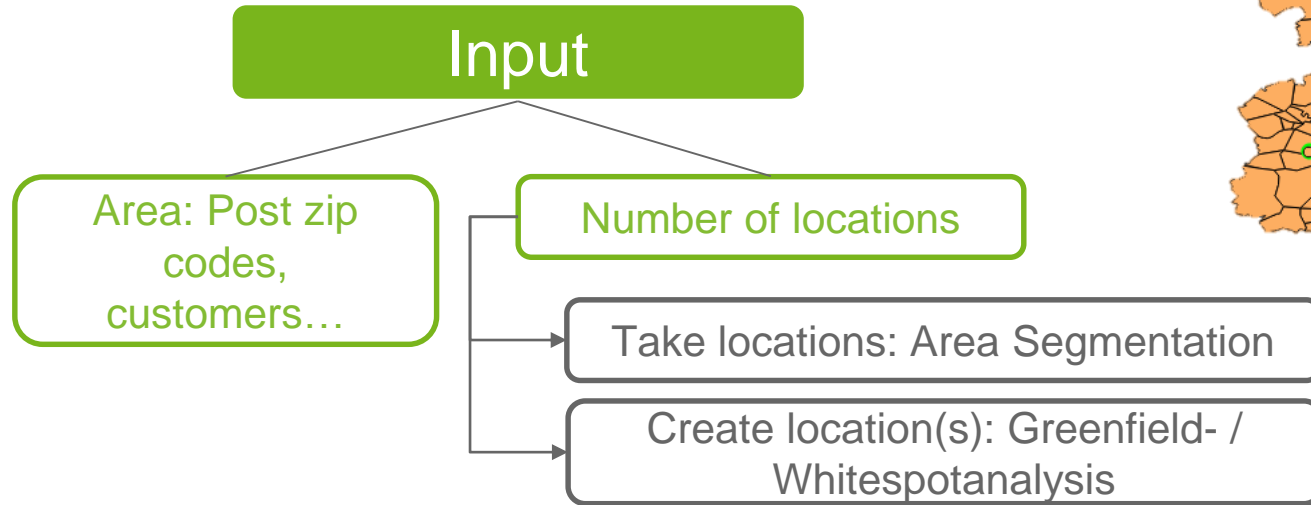
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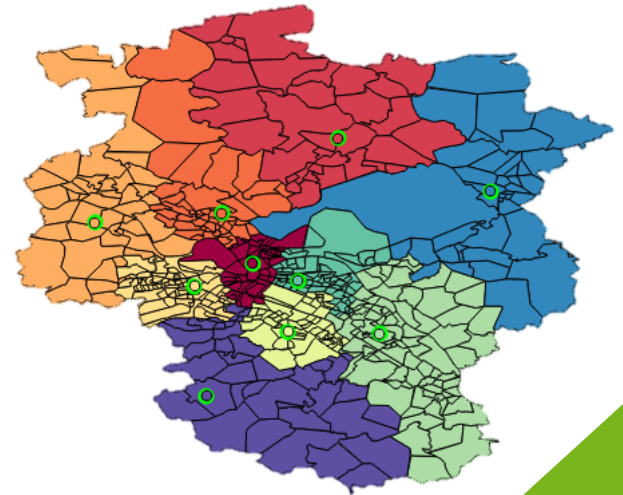
Use Case – Planning Marketing and sale areas

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[7]

How to create
areas?



Use Case – Planning Marketing and sale areas

As a company owner I would like to plan marketing and sale areas for my employees to define areas of responsibility while considering predefined criterias.



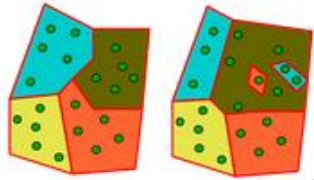


[4]

Motivation and Research Question

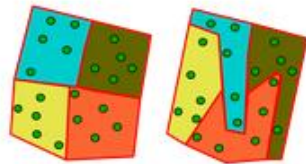
Problems of available tools

Areas not coherent



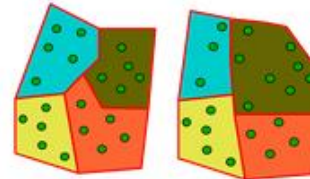
[9]

Bad compactness rate



[9]

Criteria not balanced



[9]

Slow calculation



[10]



[4]

Motivation and Research Question

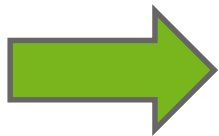
Problems of available tools

Areas not coherent

Slow calculation

Bad compactness
rate

Criteria not
balanced



Which area segmentation approach is the most promising one for the application to Geomarketing strategies considering the desired conditions?

Approach

Comparison and implementation of different algorithms

8 different algorithms

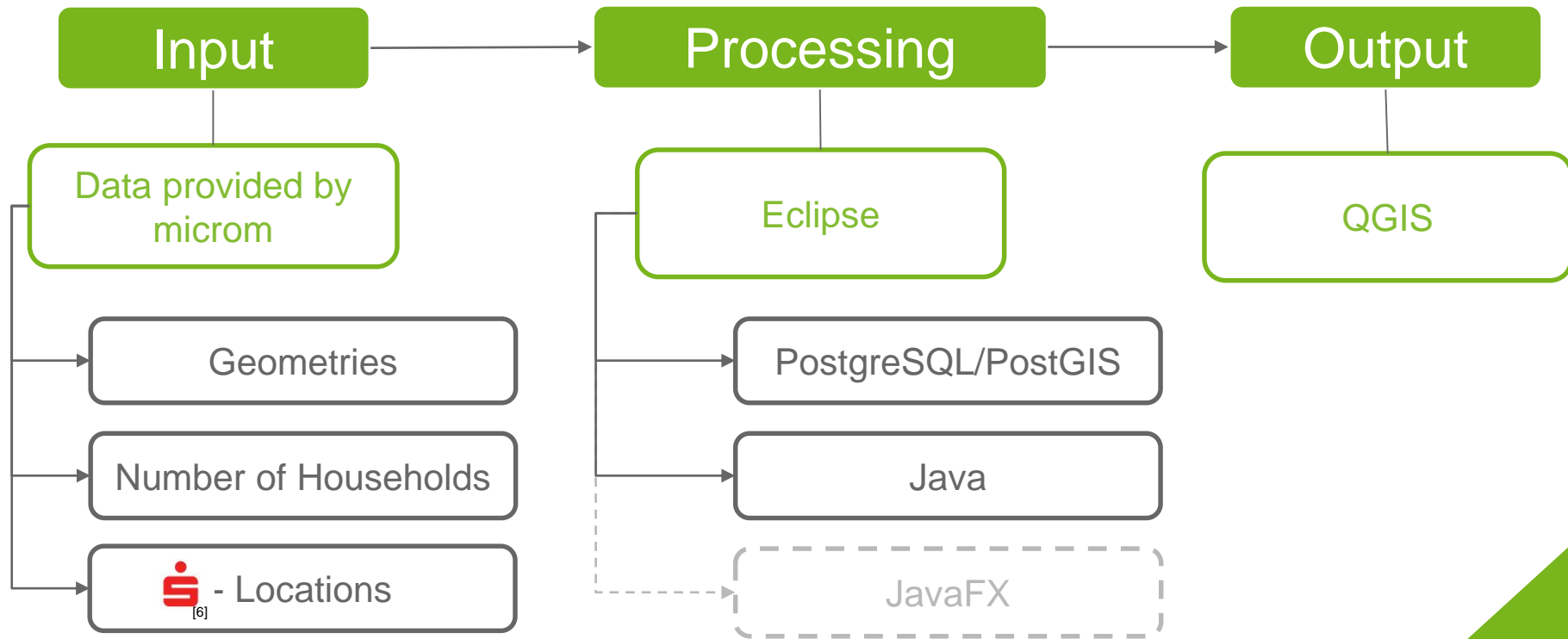
Use of decision matrix for comparison

Application of one algorithm to Geomarketing strategies



[5]

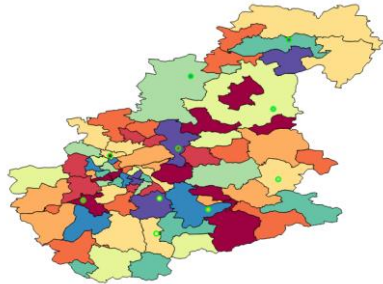
Architecture



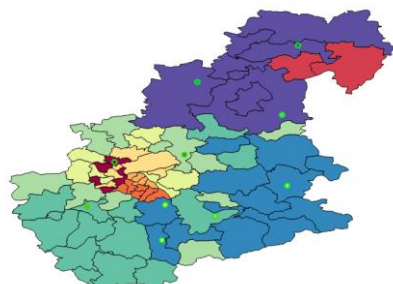
Progress



[5]



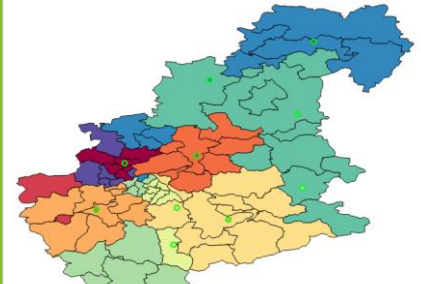
JustCrit



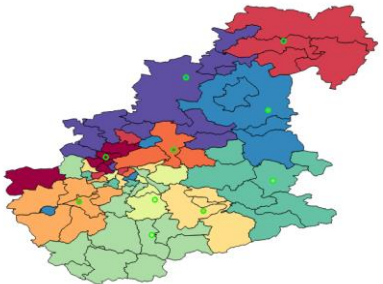
SumDivNumber



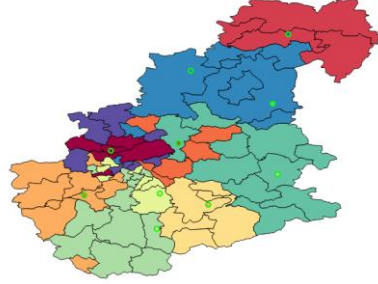
JustDist



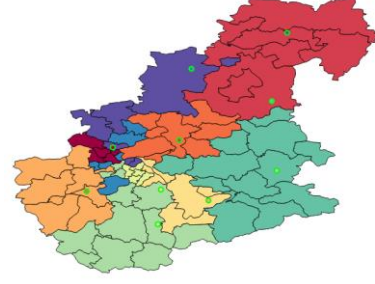
SumDivNumberDist



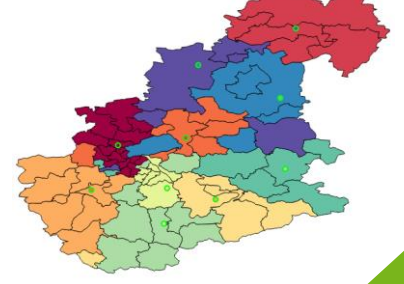
CritDistInOut



CritDistInOutTrueNearest



DistCrit



CritDistOutInInOut

Progress



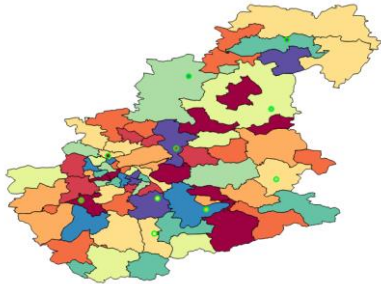
[5]

	Distance	Balanced criteria	Threshold
 JustCrit	✗	✓	✗
 SumDivNumber	✗	✓	✗
 JustDist	✓	✗	✗
 SumDivNumberDist	✓	✓	✗
 CritDistInOut	✓	✓	✗
 CritDistInOutTrueNearest	✓	✓	✗
 DistCrit	✓	✓	✓
 CritDistOutInInOut	✓	✓	✗

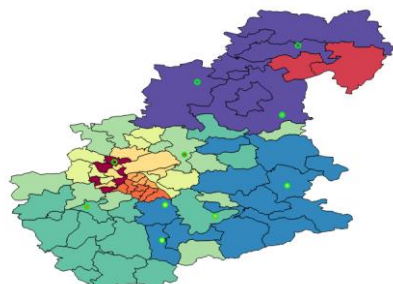
Progress



[5]



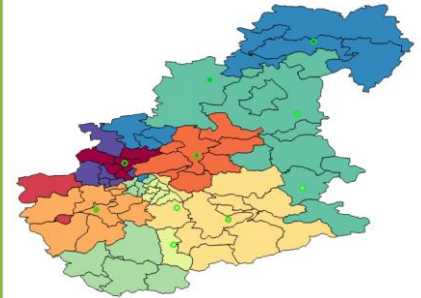
JustCrit



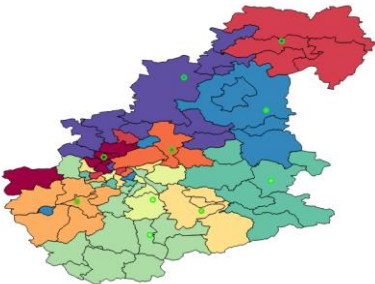
SumDivNumber



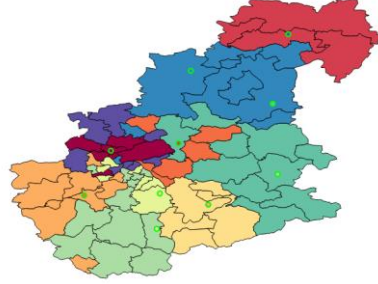
JustDist



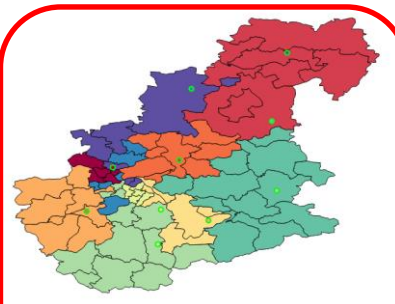
SumDivNumberDist



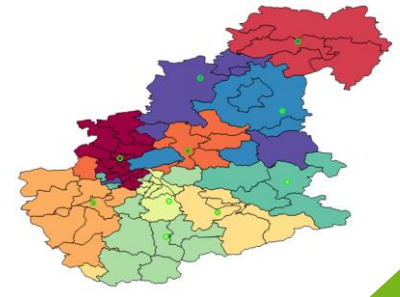
CritDistInOut



CritDistInOutTrueNearest



DistCrit

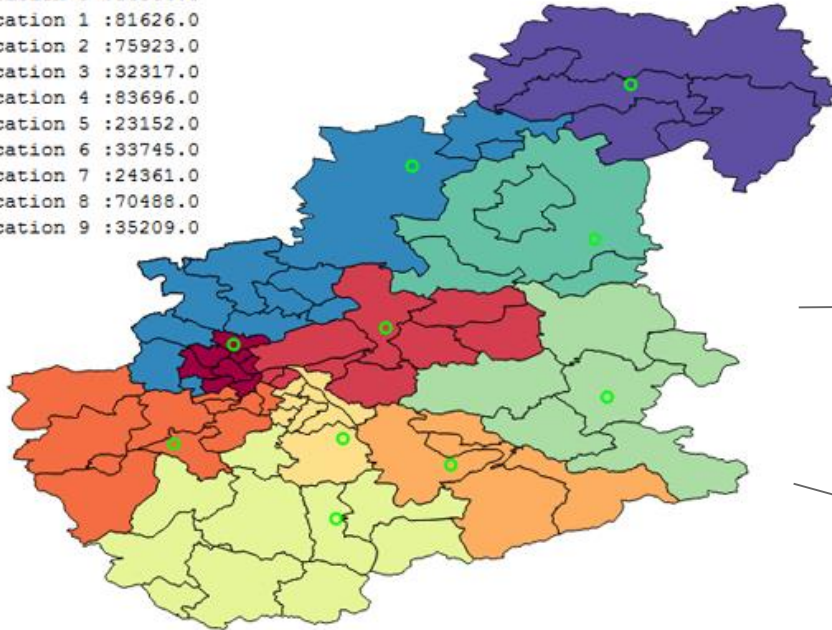
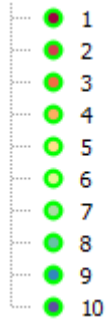


CritDistOutInInOut

Application to Area Segmentation



Critsize location 0 :86364.0
Critsize location 1 :81626.0
Critsize location 2 :75923.0
Critsize location 3 :32317.0
Critsize location 4 :83696.0
Critsize location 5 :23152.0
Critsize location 6 :33745.0
Critsize location 7 :24361.0
Critsize location 8 :70488.0
Critsize location 9 :35209.0



Balanced criteria

Coherent Areas

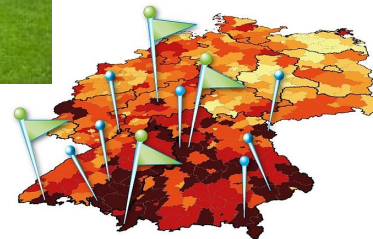
Satisfying Compactness rate

Application to Greenfieldanalysis



Where is the best place for new company locations?

How to distribute areas around them?



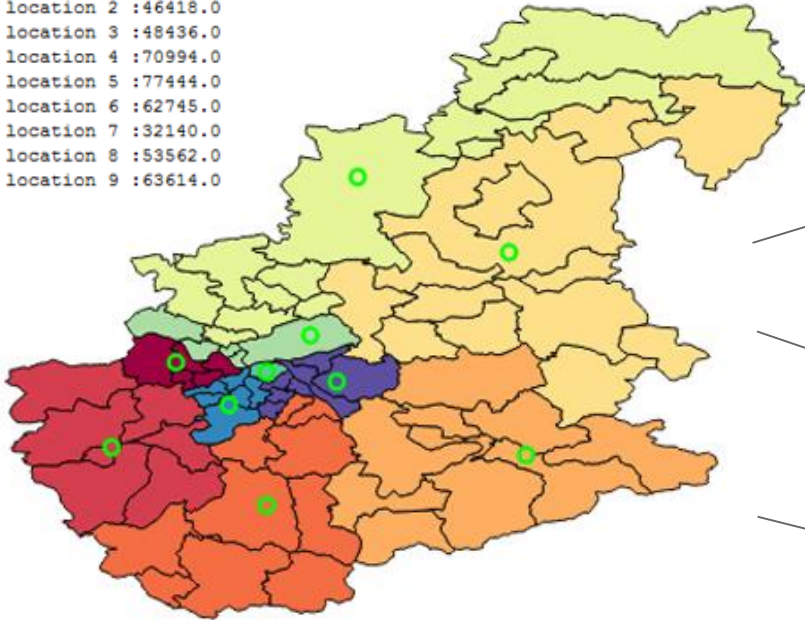
Application to Greenfieldanalysis



[5]

Critsize location 0 :50633.0
Critsize location 1 :40895.0
Critsize location 2 :46418.0
Critsize location 3 :48436.0
Critsize location 4 :70994.0
Critsize location 5 :77444.0
Critsize location 6 :62745.0
Critsize location 7 :32140.0
Critsize location 8 :53562.0
Critsize location 9 :63614.0

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10



Creating areas

Creating locations

Same area segmentation
approach

Location into middle of area

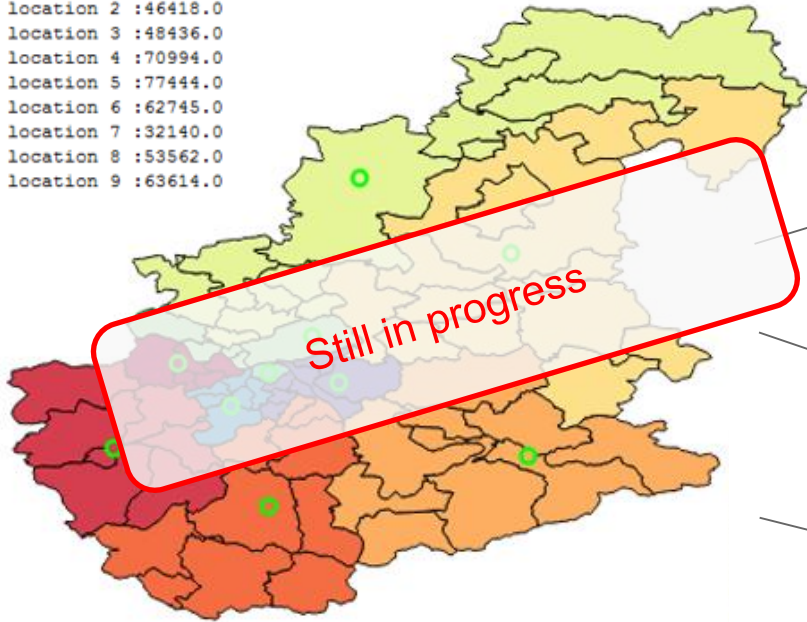
Application to Greenfieldanalysis



[5]

Critsize location 0 :50633.0
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- 1
- 2
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- 9
- 10



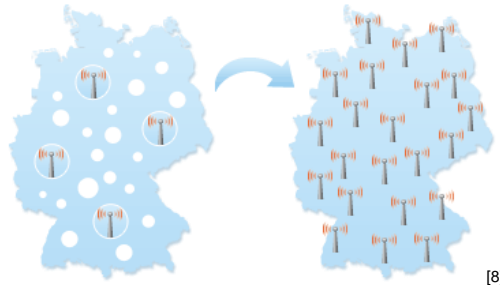
Creating areas

Creating locations

Same area segmentation
approach

Location into middle of area

Outlook & Difficulties



Application to Whitespotanalysis

Common Difficulties:



Creating an algorithm with useable results

Performance Issues

References - Sources

- <http://www.omkt.de/geomarketing/>
- <http://www.microm-online.de/>
- <http://www.mapchart.com/>
- <http://dol.iwr.kit.edu/Gebietsplanung.php>
- http://dol.iwr.kit.edu/downloads/Ergebnisse_Visueeller_Kompaktheits-Test.pdf
- <http://www.diedreifragezeichen.de/bachelorarbeit/Seminarvorlage.pdf>
- <http://mapandmarket.ptvgroup.com/de/home/>
- <http://www.easymap24.de/>
- <http://www.gfk.com/de/loesungen/geomarketing/Vertriebsgebietsplanung/Seiten/Vertriebsgebietsplanung.aspx>
- <http://cartogis.de/parallel/geom/gm-vertr.htm>

References - Images

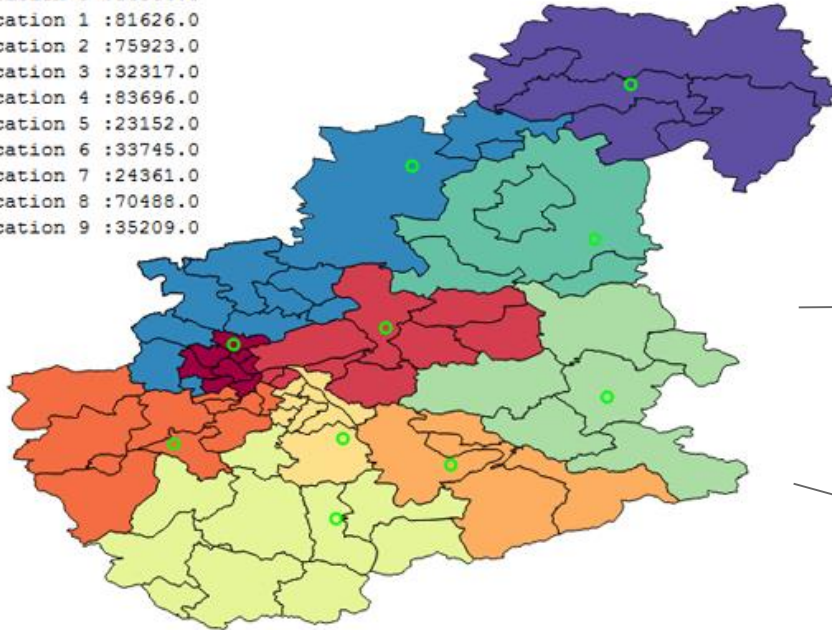
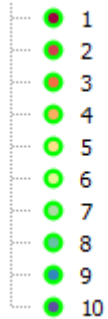
- [1] <http://www.microm-online.de/>
- [2] [https://www.kleve.de/c12572b300270277/files/recherche.jpg/\\$file/recherche.jpg?openelement](https://www.kleve.de/c12572b300270277/files/recherche.jpg/$file/recherche.jpg?openelement)
- [3] http://exista.ecms-fabrik.de/fileadmin/templates/images/Maennchen_mit_Fragezeichen.jpg
- [4] <http://www.kids-on-cruise.de/mediapool/81/811807/resources/17944837.jpg>
- [5] https://shop.versicherung-kurzzeitkennzeichen.com/images/checkliste_kurzzeitkennzeichen.png
- [6] http://www.port01.com/uploads/cities/13/locations/original/2012-02-03_15%3A53%3A43_sparkasse.jpg
- [7] <http://www.juergenzwickel.com/wp-content/uploads/2014/12/Ma%CC%88nnchen-auf-Fragezeichen.jpg>
- [8] <https://www.zebradem.com/wiki/images/3/3c/Lte-weiße-flecken.png> their contact and experiences with costumers
- [9] <http://dol.ior.kit.edu/Gebietsplanung.php>
- [10] <http://www.glasdeko24.de/images/produkte/i19/194-sanduhr-kirsche22.jpg>
- [11] <http://bilder.4ever.eu/tag/936/grüne-wiese?pg=4>



[5]

Application to Area Segmentation

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 Critsize location 3 : 32317.0
 Critsize location 4 : 83696.0
 Critsize location 5 : 23152.0
 Critsize location 6 : 33745.0
 Critsize location 7 : 24361.0
 Critsize location 8 : 70488.0
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Balanced criteria

Coherent Areas

Satisfying Compactness rate

$$\vartheta = \Delta c * \omega_1 + \Delta crit * \omega_2 \rightarrow \min$$