



THE UNIVERSITY OF  
MELBOURNE

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Melbourne School of Engineering

# Doktorsko istraživanje u Melbourneu

20 April 2018





## Sadržaj

1. Zašto Melbourne?
2. Istraživački studiji u Melbourneu
3. O zahtjevima, prijavi i stipendiji
4. O doktorskom studiju na Sveučilištu u Melbourneu
5. Jelenino istraživanje
6. Ivanovo istraživanje



## Zašto Melbourne?



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## Zašto Melbourne?

- Broj 1 u Australiji (ARWU 2017 i THE 2018)
- Broj 32 u svijetu (THE 2018)
- Broj 39 u svijetu (ARWU 2017)







## Zašto Melbourne?

### Sveučilište u Melbourneu nudi:

- Dobar međunarodni ugled u istraživanju
- Priliku za profesionalno umrežavanje i razvoj međunarodne suradnje
- Research-intensive pristup
- Veliki raspon disciplina, novih i tradicionalnih





## Istraživački studiji u Melbourneu



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## Types of graduate research degrees

### **Doctor of Philosophy (PhD)**

- Up to four years full time
- 80 000–100 000 word thesis
- Minimal or no coursework

### **Masters by research**

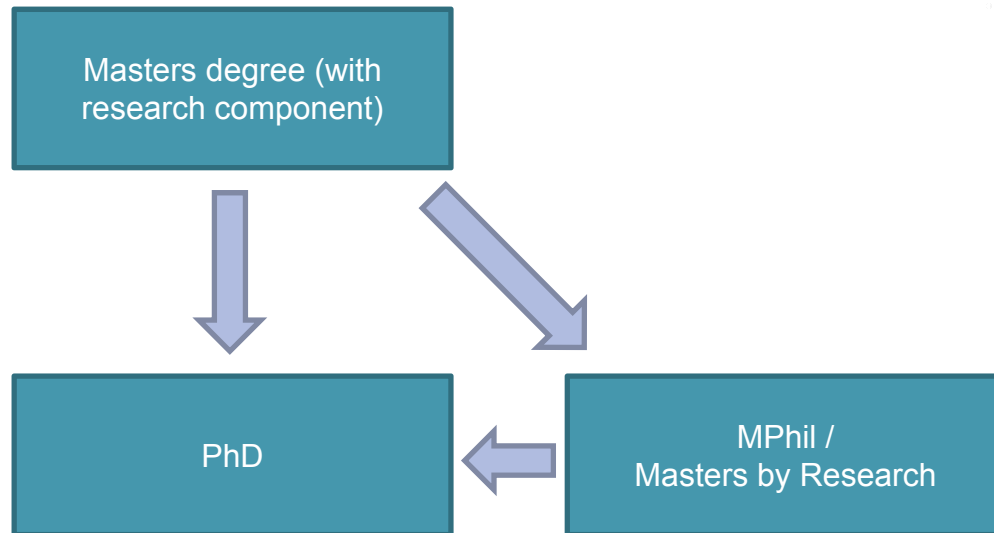
- Allows for up to 30% coursework
- Up to 2 years full time + 30 000 word thesis

### **Master of Philosophy (MPhil)**

- Up to 2 years full time
- 30 000–40 000 word thesis
- Minimal or no coursework



## Pathways to a graduate research degree







## O zahtjevima, prijavi i stipendiji



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# Potruga za doktorskim studijem

## 1. Destinacije

- Australija, Kanada, SAD, Europa

## 2. Razlike u stipendijama

## 3. Razlike u trajanju studija

## 4. Razlike u studijskim programima



## Priprema za doktorski studij

1. Odlučiti na vrijeme
2. Ocjene
3. Angažman
  - Radno iskustvo
  - Demonstriranje
4. Objava radova
5. Nagrade
6. Dobar diplomski rad



## Zahtjevi

1. Diplomski studij s najmanje 25% istraživačke komponente
2. Imati visoki prosjek
3. Biti u 5% najboljih studenata na smjeru
4. Engleski jezik

<http://www.eng.unimelb.edu.au/study/degrees/phd/overview#overview>





## Prijava na doktorski studij

### Prijava na PhD i Melbourne Graduate Research Scholarship

1. Decide on a research program
2. Check your eligibility
3. Find a supervisor
4. Check the scholarship deadlines
5. Prepare documentation
6. Submit an application
7. Accept the offer
8. Enrol in your program



## Melbourne Graduate Research Scholarship

1. Puna školarina do 4 godine istraživanja
2. Troškovi života do 3.5 godine (za 2018. 30,000 AUD)
3. Bolovanje, porodiljni, roditeljski dopust.
4. Troškovi preseljenja (3,000 AUD)
5. Zdravstveno osiguranje za internacionalne studente

**Školarina za 4 godine: 179,853 AUD**

**Typical course fee for 2018: 41,728 AUD / year**

[scholarships.unimelb.edu.au](http://scholarships.unimelb.edu.au)



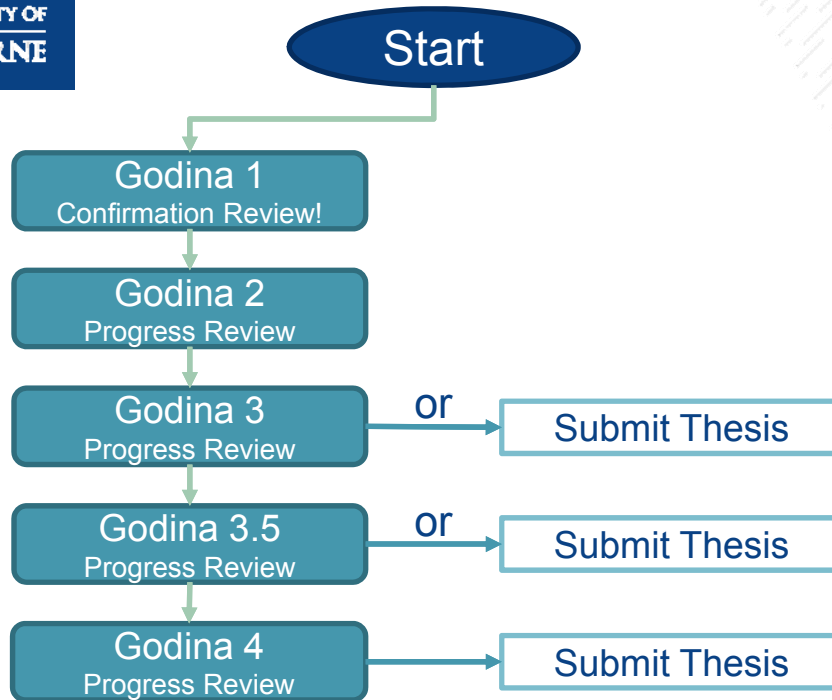
## O doktorskom studiju na Sveučilištu u Melbourneu



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## PhD timeline







# Integrity Monitoring for Multi-GNSS in Urban Environments

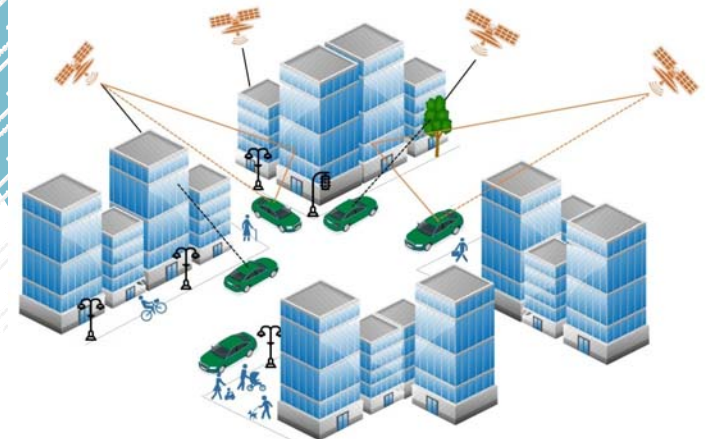
Jelena Gabela





## Motivacija

- GNSS – problem dostupnosti u urbanom okolišu
- GNSS + IMU
  - IMU: akumulacija pogrešaka
- S razvojem sustava za naplatu cestarina, sustava protiv sudara, autonomnih vozila  
→ postojeća rješenja su nedovoljna





## Motivacija

- Točnost više nije primarni problem
- Povjerenje u procjenu položaja → integritet

### *INTEGRITY*

*of the navigation system solution is level of trust one can put in the correctness of that solution in regards to the true position, which includes timely warnings when the system is not to be trusted*



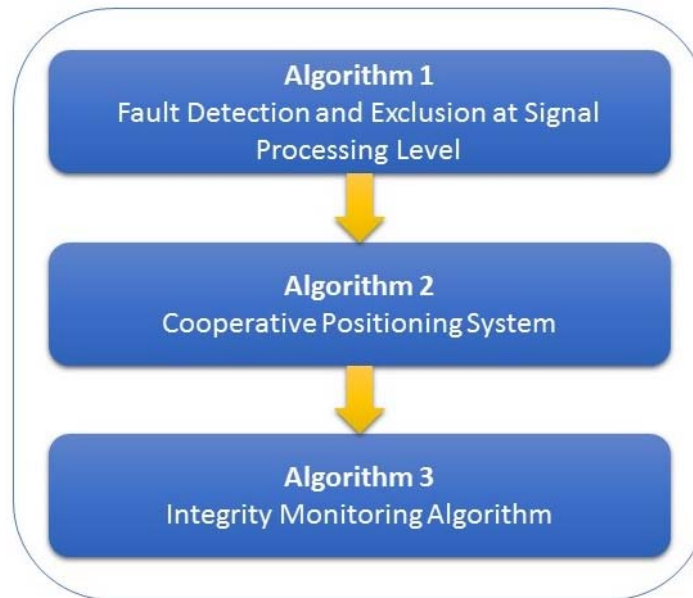
## Pregled literature

- Koncept integriteta – civilna avijacija
- Mnogo postojećih algoritama se temelji isključivo na GNSS-u ili čak samo GPS-u
- Izvori pogrešaka karakteristični za urbani okoliš nisu uzeti u obzir
- Često, slučaj samo jednog ‘pogrešnog’ satelita uzet u obzir
- ...



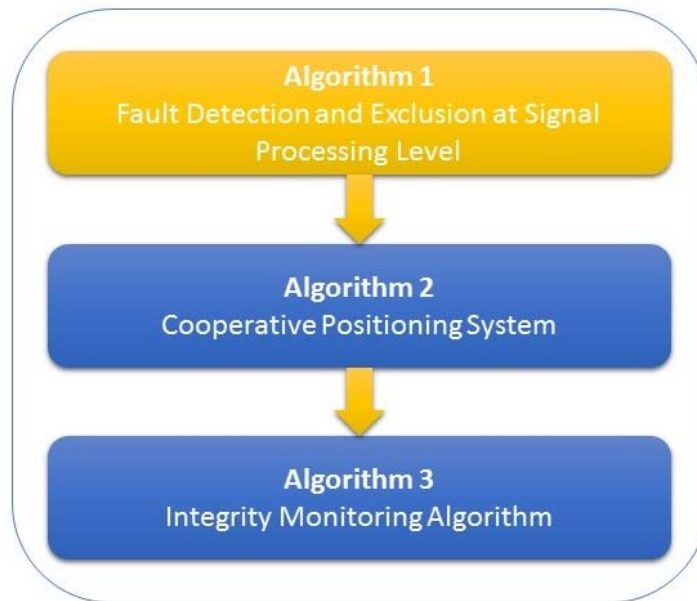


## Metodologija



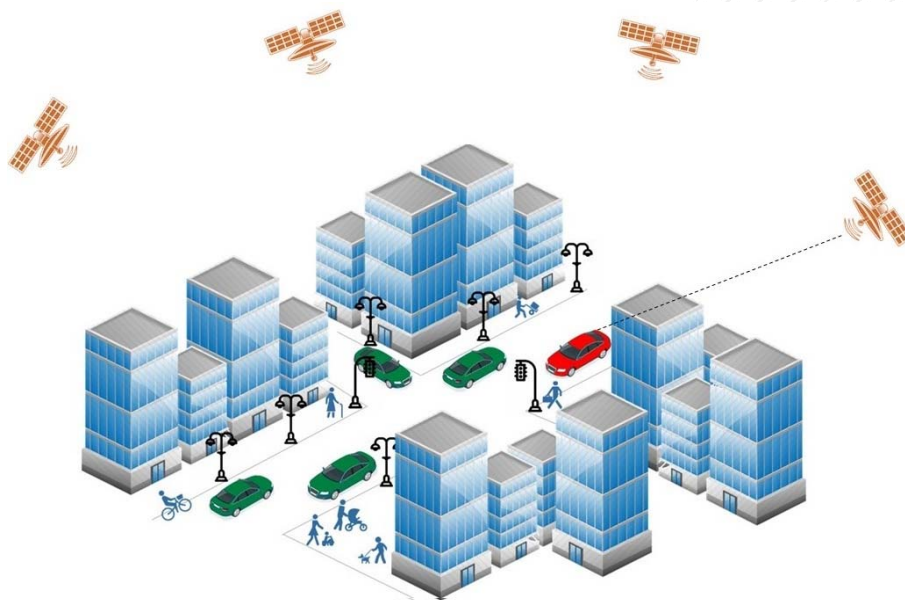


## Metodologija



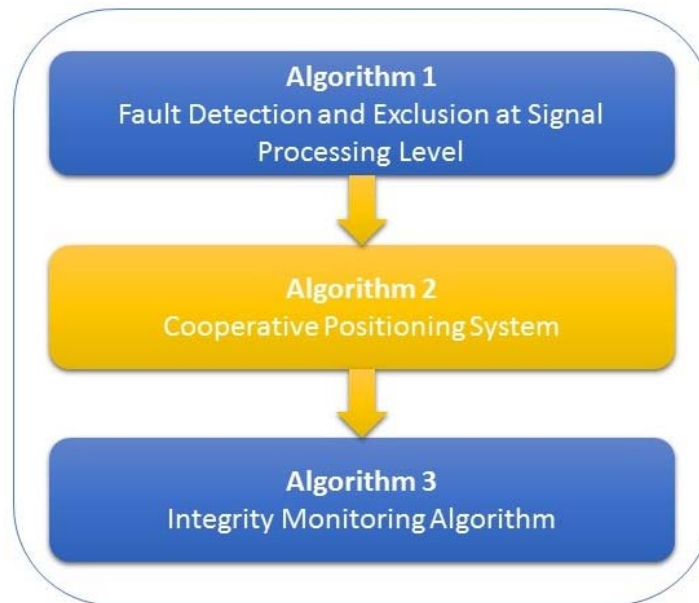


# Metodologija





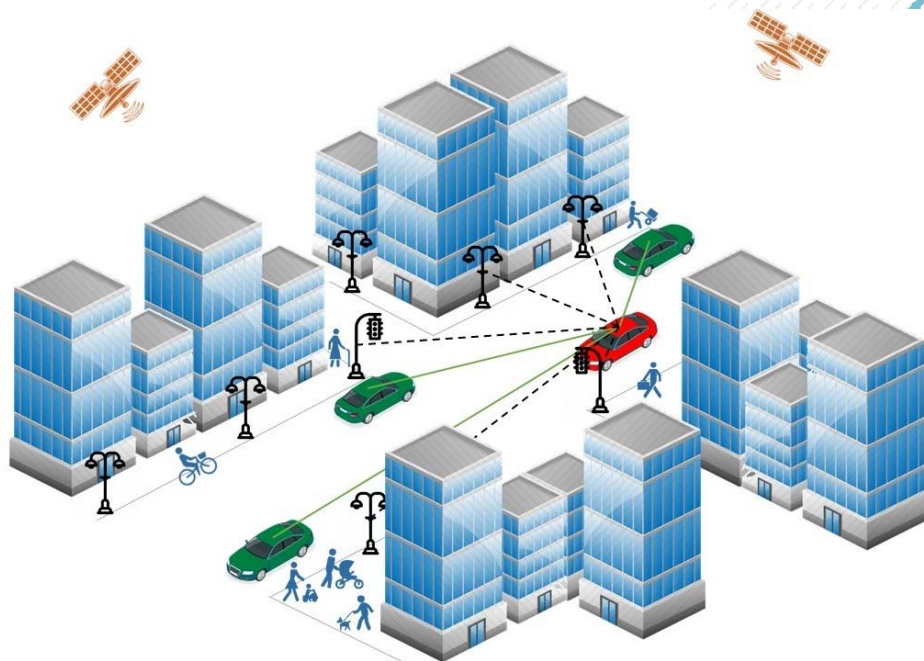
## Metodologija







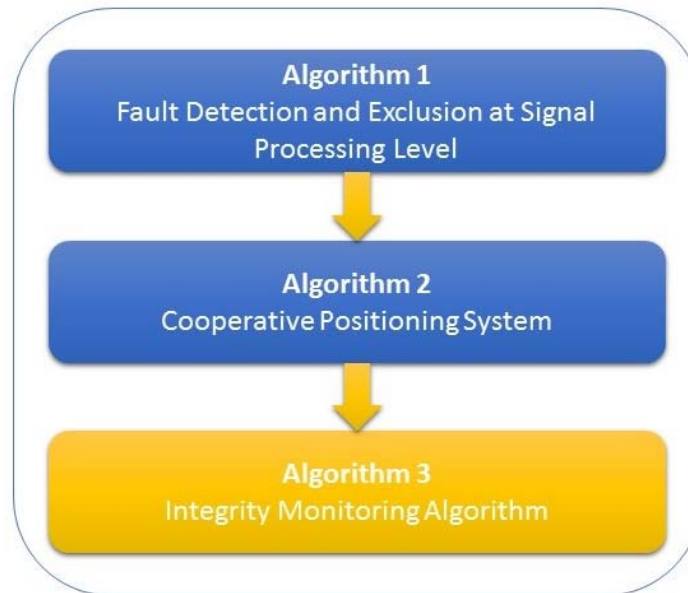
## Metodologija



V-2-V + V-2-I  
Cooperative Positioning

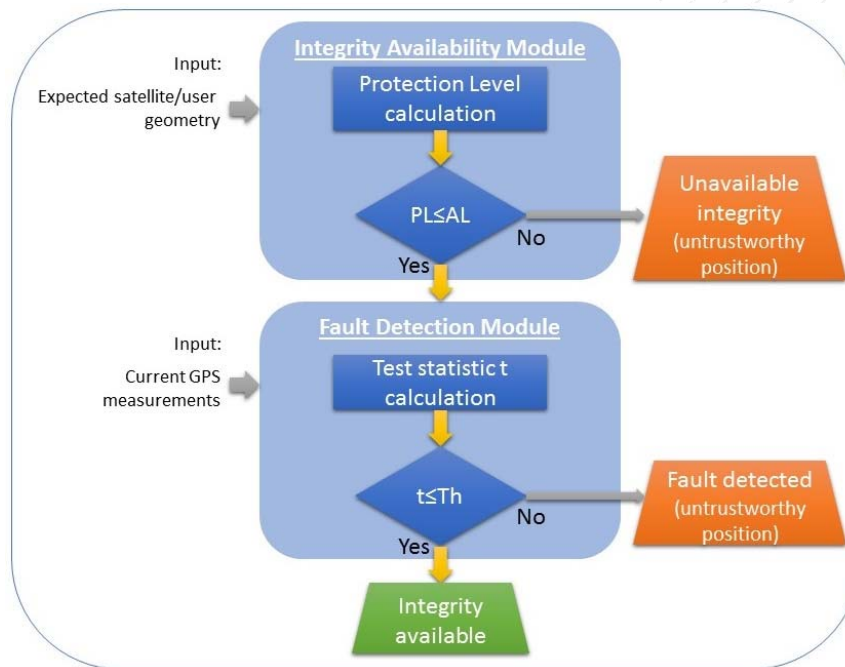


## Metodologija





# Metodologija





# Automated error detection in map databases

Ivan Majić







# Motivation

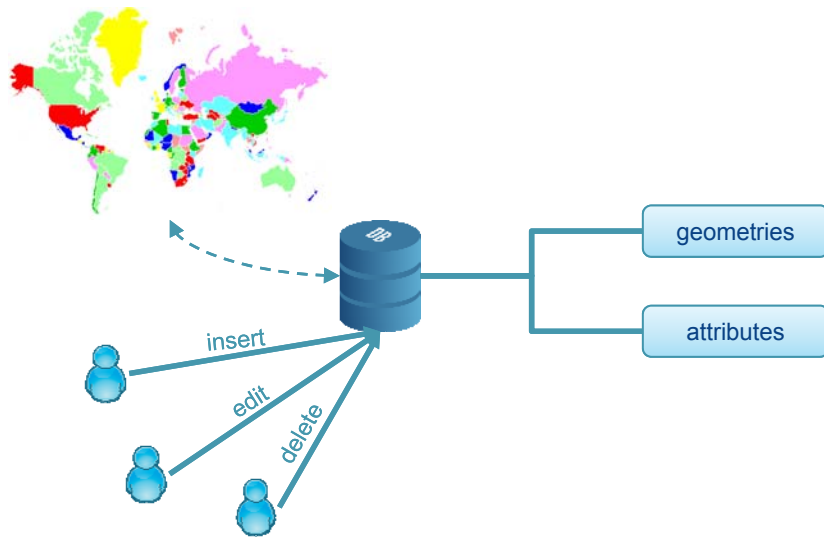




## Research hypothesis

*“Errors in **mature datasets** occur in form of inconsistencies in the data such as outliers, and can be detected in an automated way”*

**assumption of mature datasets**





## Work packages

Spatial errors

Semantic and  
topo-semantic  
errors

Spatial  
variations

Changes in  
data





## Work packages

Spatial errors

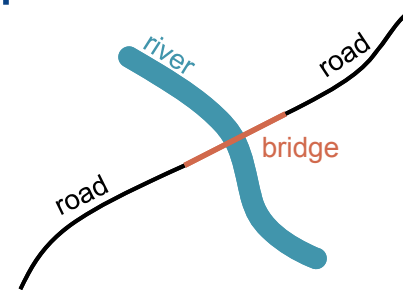
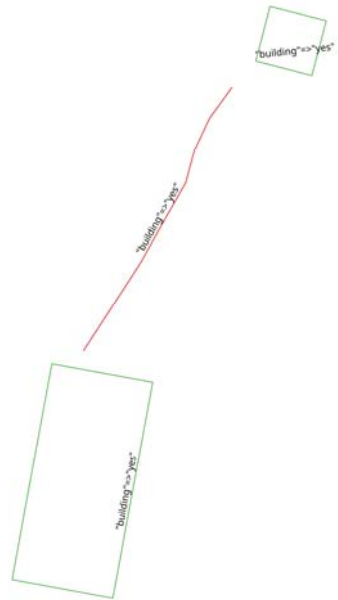
Semantic and  
topo-semantic  
errors

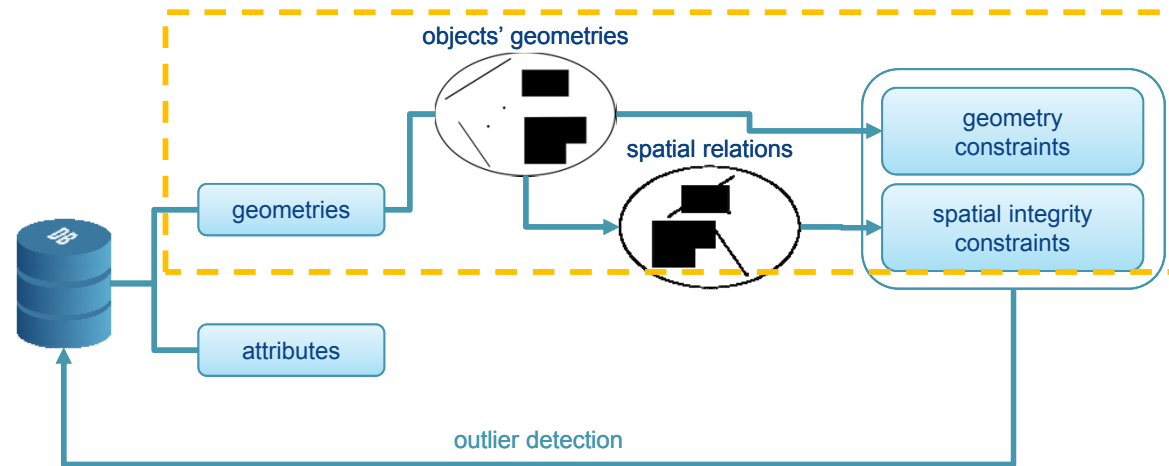
Spatial  
variations

Changes in  
data



## WP1 Detecting spatial errors







## Work packages

Spatial errors

Semantic and  
topo-semantic  
errors

Spatial  
variations

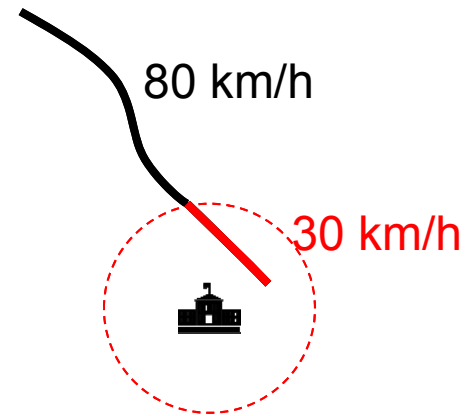
Changes in  
data

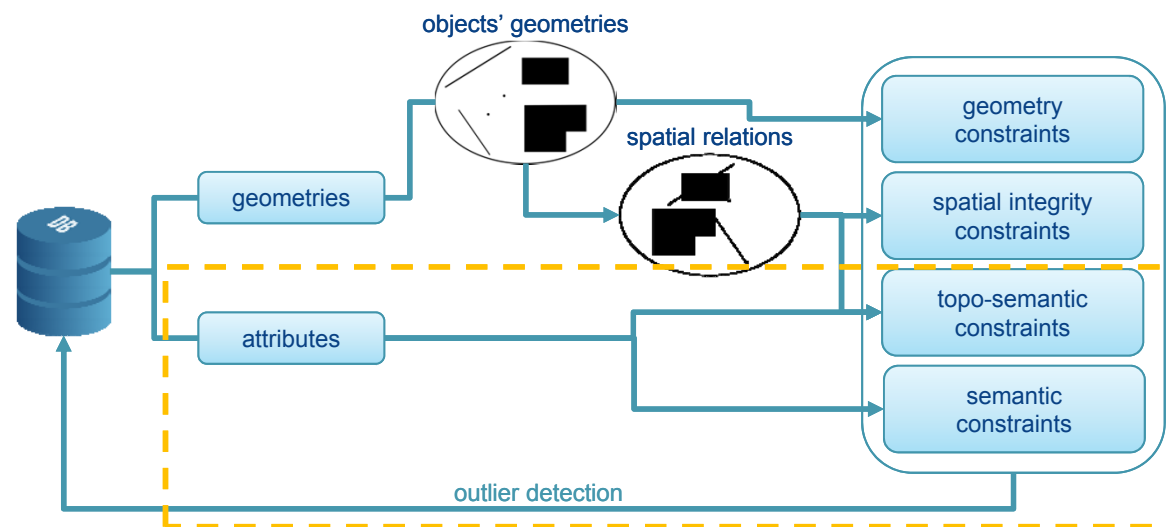




## WP2 Detecting semantic and topo-semantic errors

building:levels
1
2
3
4
5
6
7
10
1 Tongala and Distrcit Memorial
<b>500</b>
5







## Work packages

Spatial errors

Semantic and  
topo-semantic  
errors

Spatial  
variations

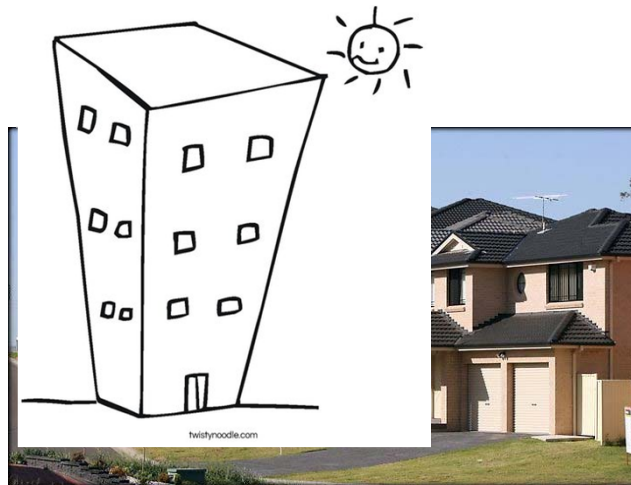
Changes in  
data



## WP3 Analysis of spatial variations in error detection

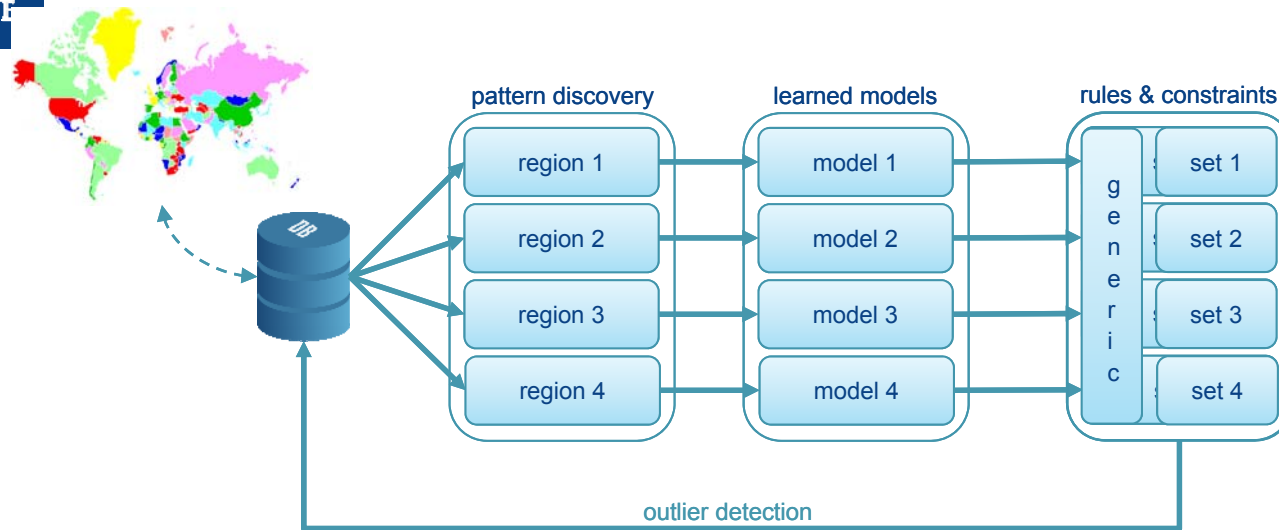


Tall





# WP3 Analysis of spatial variations in error detection







## Work packages

Spatial errors

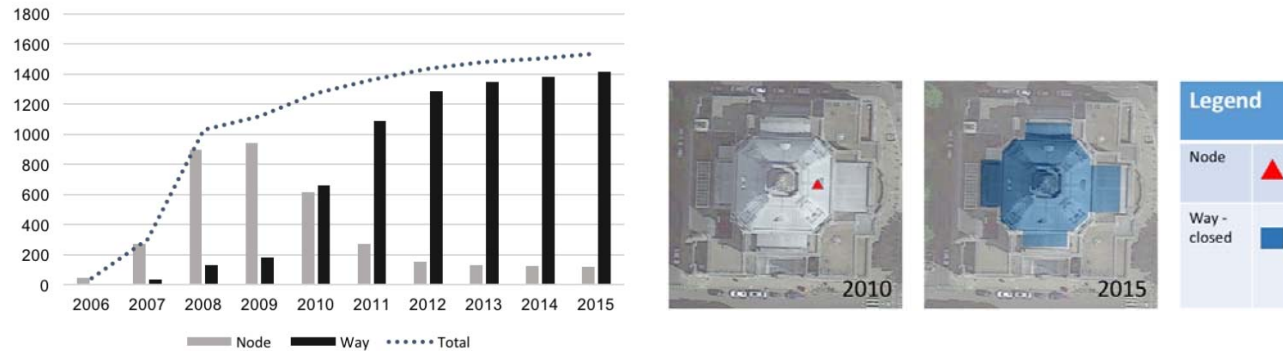
Semantic and  
topo-semantic  
errors

Spatial  
variations

Changes in  
data



## WP4 Continuous changes and updates in the data

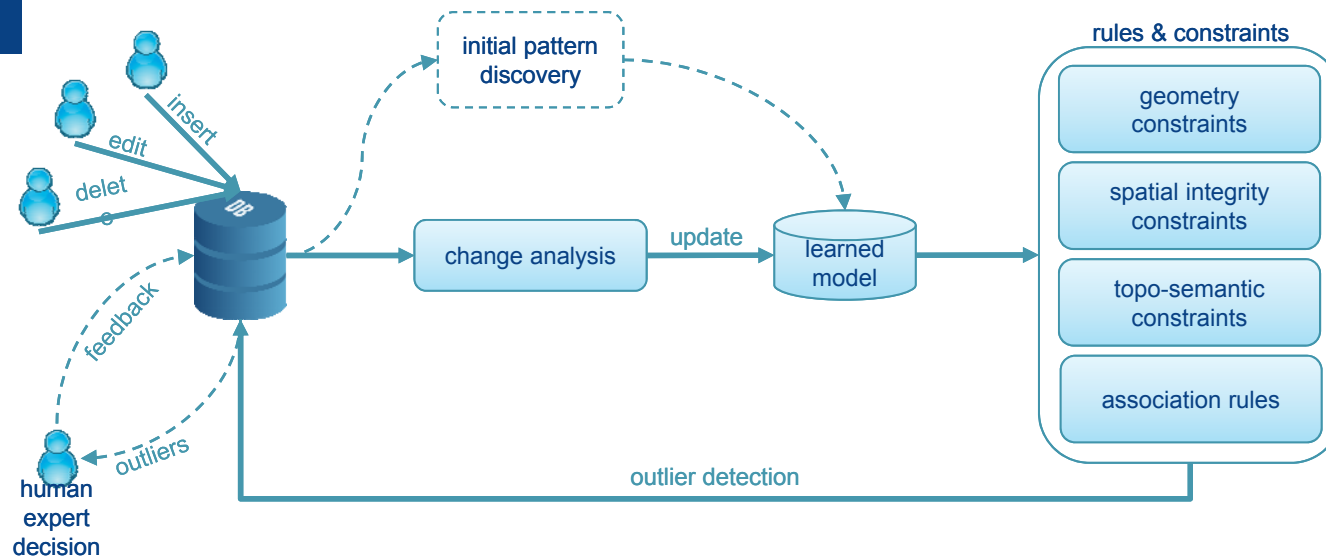


(b) Birmingham (school, place\_of\_worship, pub)

Trends in objects' representations (Maguire and Tomko, 2016)



# WP4 Continuous changes and updates in the data





## Život u Australiji



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## Iskustvo doktorskog studija

- Suradnja s drugim studentima
- Obveze
- Odlasci na konferencije
- Top-up stipendije
- Držanje vježbi na sveučilištu
- Svakodnevnicu PhD studenta





## Iskustvo života u Melbourneu

- Troškovi života
- Multikulturalnost
- Stil života
- Putovanja
- Prilagodba na klimu
- Hrana



31.12.2017.

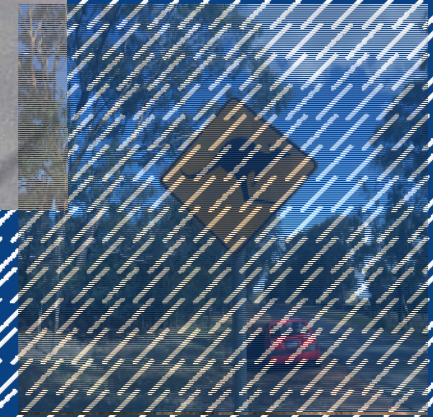


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# Questions?







## Contact us

### How to apply

Web: [futurestudents.unimelb.edu.au/info/research](https://futurestudents.unimelb.edu.au/info/research)

Information on living in Melbourne, visa requirements, accommodation and how to get started as a University of Melbourne student

Web: [services.unimelb.edu.au/international](https://services.unimelb.edu.au/international)

### What to expect as a graduate researcher

Web: [gradresearch.unimelb.edu.au](https://gradresearch.unimelb.edu.au)

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**Ivan Majic**

Email: [imajic@student.unimelb.edu.au](mailto:imajic@student.unimelb.edu.au)