



Western  
UNIVERSITY · CANADA

Mike Ghesquiere  
Andrew Kope  
Cindy Liu  
Jordan Van Dyk  
Yuchen Zhong

# URBANITY

URBAN DEVELOPMENT INDEX:  
A Data Driven Machine Learning Approach  
For Targeted Marketing in Urban Centres

# Why measure urbanity?

Marketing

Land Development

Urban Planning

up to  
**\$20**  
million

**\$20**  
billion

# Problem:

Past definitions are **arbitrary**.

A **quantitative methodology** is required.





Satellite





# Satellite

Toronto

Tri-city  
Area

Hamilton

London





Toronto


Tri-city  
Area

Hamilton

London

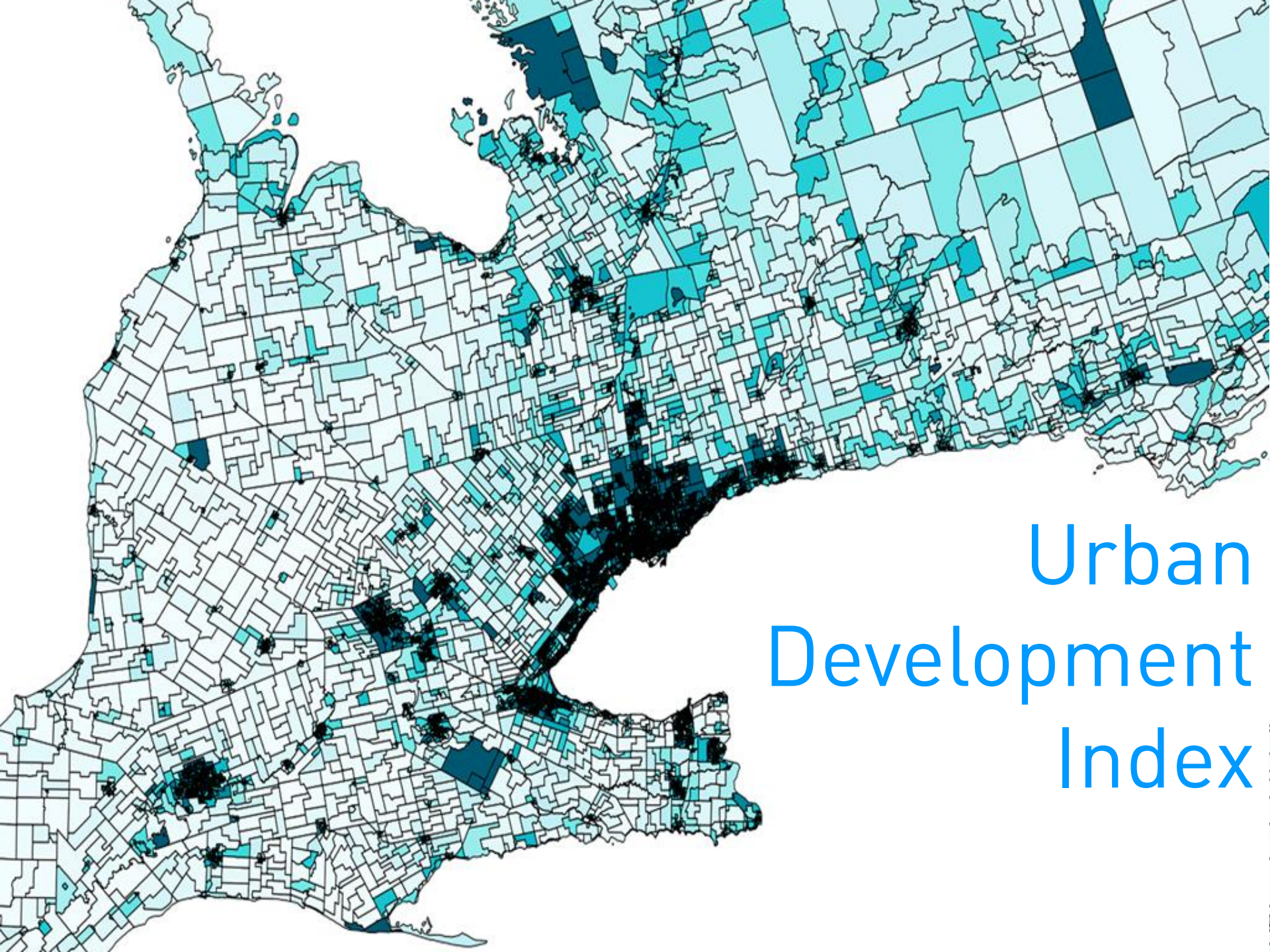
Recoloured



An aerial photograph of a coastal region, possibly a bay or estuary, with a large body of water on the left and a smaller inlet on the right. The land is covered in dense vegetation, primarily in shades of brown and green. A semi-transparent map overlay is visible, showing the same geographical area with a color scheme of brown and blue. The word "Recoloured" is written in white text on the right side of the image.

Recoloured





Urban  
Development  
Index



# Quantifying Urbanity

## Geosocial Features:

Population

Ethnic Diversity

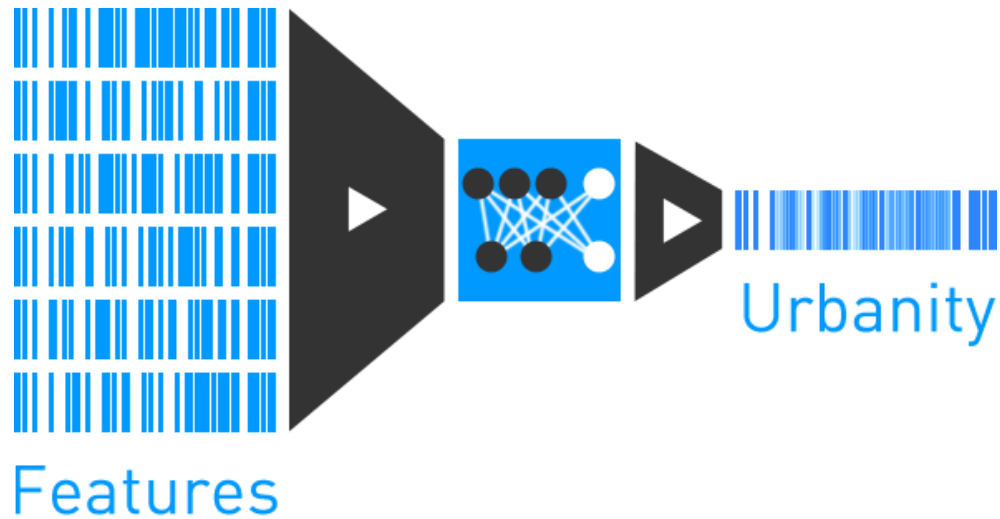
Employment Sector

Immigration and Emigration



# The C.R.B.M.

Continuous Restricted Boltzmann Machine



Objective  
Data-driven  
Infinitely Extensible



# Actualization

Feature Planning (2 months)

Implementation (4 months)

Validation (3 months)



# Conclusions

City Planning  
Land Development  
Targeted Marketing

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Dr. Xianbin Wang  
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Ontario Centres of  
Excellence  
Where Next Happens



**NSERC**  
**CRSNG**



London  
CANADA



