# Remote Sensing for Socio-Demographic Applications

1st Yvette Espinoza
*Software Engineer*
*Northrop Grumman*
Redondo Beach, CA, USA
yespinoz@purdue.edu

***Abstract*—The urban population has increased dramatically in the last few decades, but the rapid rate of urbanization has caused a strain on the available resources, leaving many to live in deprived, or impoverished areas. To address these socio-demographic issues policymakers typically rely on traditional survey-based data, like the census, but such data is complex to acquire and can quickly become outdated. Earth observations are the proposed solution to the gaps left by traditional data. Artificial intelligence and deep learning algorithms are being used to detect changes on the earth's surface, such as detecting new urban areas. New research has focused on classifying elements of the city itself, monitoring waste disposal sites and traffic to have a better understanding of the deprived areas and their needs. This project will analyze urban characteristics, what makes an area 'deprived', and discuss the uses of remote sensing in socio-demographic applications while attempting to use real data to extract the characteristics of a city.**

## References

[1] Stefanos Georganos et al. "Is It All the Same? Mapping and Characterizing Deprived Urban Areas Using WorldView-3 Superspectral Imagery. A Case Study in Nairobi, Kenya". In: *Remote Sensing* 13.24 (2021). ISSN: 2072-4292. DOI: 10.3390/rs13244986. URL: https://www.mdpi.com/2072-4292/13/24/4986.

[2] Jinxin Guo et al. "Identify Urban Area From Remote Sensing Image Using Deep Learning Method". In: *IGARSS 2019 - 2019 IEEE International Geoscience and Remote Sensing Symposium*. 2019, pp. 7407–7410. DOI: 10.1109/IGARSS.2019.8898874.

[3] Li Lin et al. "Remote Sensing of Urban Poverty and Gentrification". In: *Remote Sensing* 13.20 (2021). ISSN: 2072-4292. DOI: 10.3390/rs13204022. URL: https://www.mdpi.com/2072-4292/13/20/4022.

[4] Paloma Merodio Gómez et al. "Earth Observations and Statistics: Unlocking Sociodemographic Knowledge through the Power of Satellite Images". In: *Sustainability* 13.22 (2021). ISSN: 2071-1050. DOI: 10.3390/su132212640. URL: https://www.mdpi.com/2071-1050/13/22/12640.

[5] Wenzhong Shi et al. "Change Detection Based on Artificial Intelligence: State-of-the-Art and Challenges". In: *Remote Sensing* 12.10 (2020). ISSN: 2072-4292. DOI: 10.3390/rs12101688. URL: https://www.mdpi.com/2072-4292/12/10/1688.