



A nowcasting model for Medellín city

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Motivation

The streets of Barcelona during the Spanish crisis!

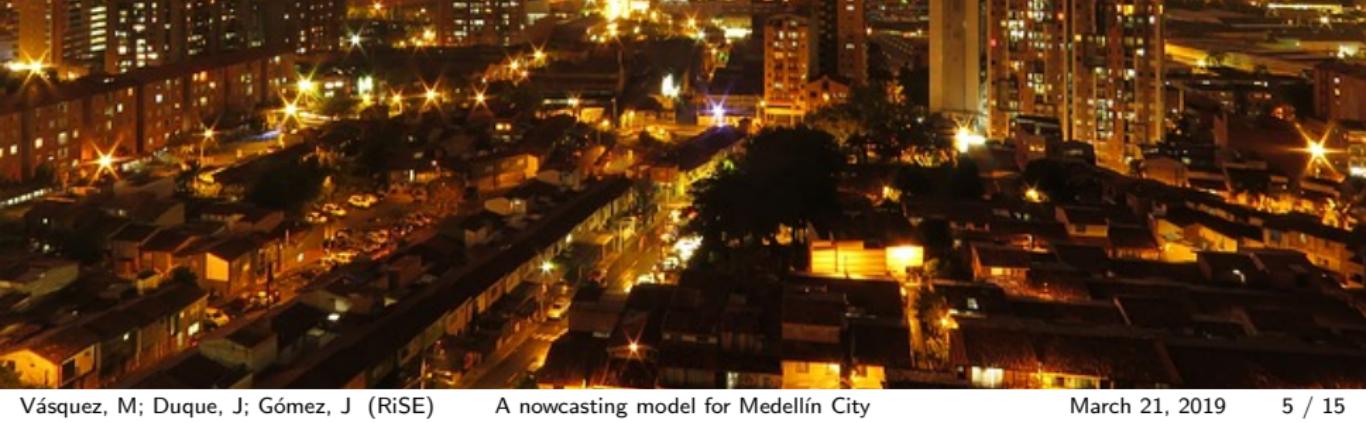


Nowcasting

"The prediction of the past, the very near future and the very recent past" (Elliott & Timmermann 2013)

General Objective

Design a nowcasting model for Medellín city to generate a macroeconomic indicator with a higher frequency than what is currently available by processing images of cameras located in strategic places of the city.



```
4 # Prevent database truncation of the migration test
5 abort("The Rails environment is running in production mode")
6 require 'spec_helper'
7 require 'rspec/rails'
```

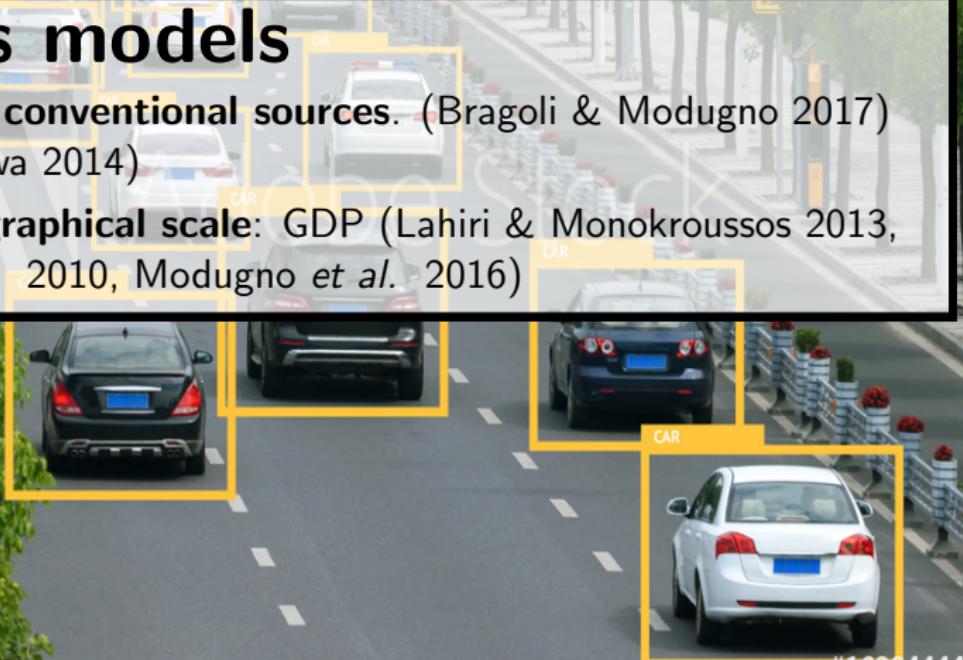
Specific objectives

- ▶ Perform a literature review of the state of art for nowcasting models based on digital image processing and artificial intelligence.
- ▶ Determine the information to be extracted from the image as well as the track segments to be monitored.
- ▶ Determine and characterize the macroeconomic variable to estimate.
- ▶ Design an econometric strategy that makes good use of the data obtained and the macroeconomic variable.



Previous models

- ▶ Data from conventional sources. (Bragoli & Modugno 2017) and (Urasawa 2014)
- ▶ Large geographical scale: GDP (Lahiri & Monokroussos 2013, Karim *et al.* 2010, Modugno *et al.* 2016)





Innovation

- ▶ Time series econometrics and Convolutional Neural Networks (CNN).
- ▶ Diagnosis of the real state of the city's economy.

```

* @var boolean
*/
define('PSI_INTERNAL_XML', false);
if (version_compare("5.2", PHP_VERSION, ">")) {
    die("PHP 5.2 or greater is required!!!");
}
if (!extension_loaded("pcre")) {
    die("pnpSysInfo requires the pcre extension to php in order to work
        properly.");
}
require_once APP_ROOT . '/includes/a year older inc.php';

```

Scope

3 stages for the investigation (a year older inc.php).

```

// Load configuration
require_once APP_ROOT . '/config.php';
if (!defined('PSI_CONFIG_FILE') || !defined('PSI_DEBUG')) {
    $tpl = new Template("/templates/html/error_config.html");
    echo $tpl->fetch();
}

```

Schedule

1. Writing a research proposal.
2. Perform a complete literature review.
3. Designing the final model
4. Learning and exploring digital image processing technology, and associated libraries.
5. First implementation of the image processing methodology with example data
6. Determination of the track segments to be monitored.
7. Search and contact key actors to get historical videos of selected places in Medellín.
8. Start writing a paper:
 - 8.1 Paper's introduction: first draft.
 - 8.2 Paper's state of art: first draft.
 - 8.3 Paper's methodology section: first draft.

Table 1: Schedule overview.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8 (a)																			
8 (b)																			
8 (c)																			

Relevant information



The results of this practice are framed within the PEAK Urban project. The project is developed within the RiSE group, having as main tutors:

- ▶ Juan Carlos Duque Cardona: Ph.D. in Business Studies, Universidad de Barcelona. Professor in the School of sciences, mathematical sciences department and part of the RiSE group, Universidad EAFIT. jduquec1@eafit.edu.co
- ▶ Jairo Alejandro Gómez Escobar, Ph.D. in Engineering (Robotics), University of Sydney. Researcher at RiSE group, Universidad EAFIT. jagomeze@eafit.edu.co

References I

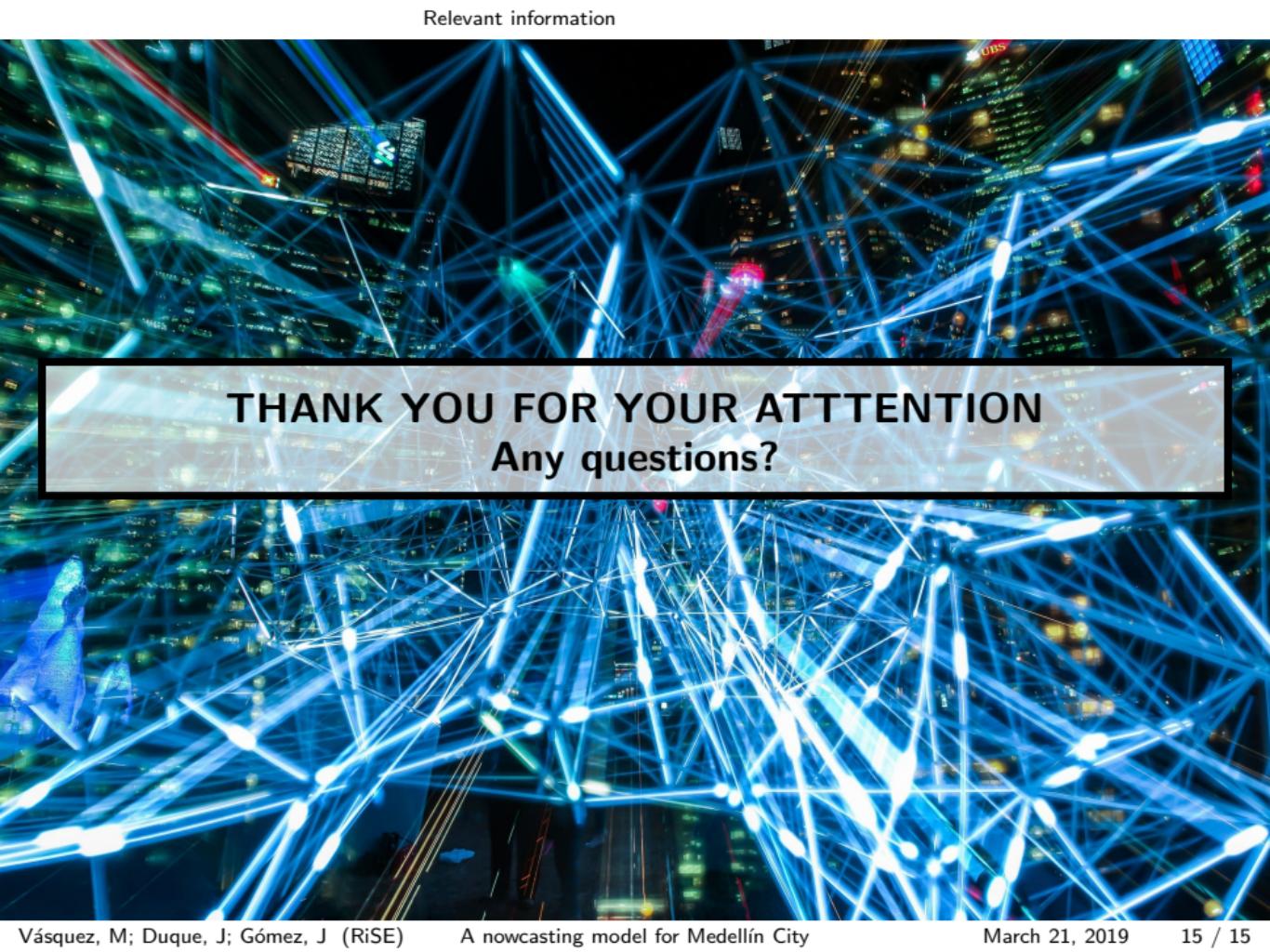
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References II

Urasawa, Satoshi. 2014. Real-time GDP forecasting for Japan: A dynamic factor model approach. *Journal of the Japanese and International Economies*, 34, 116 – 134.

Image source:

- ▶ <https://www.pexels.com>
- ▶ <https://pixabay.com/es/>
- ▶ <http://www.eafit.edu.co>



THANK YOU FOR YOUR ATTENTION
Any questions?