

**IDATHA**

MEMBER OF  
**pyxis**  
ECOSYSTEM



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# MLOps



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## WHO WE ARE



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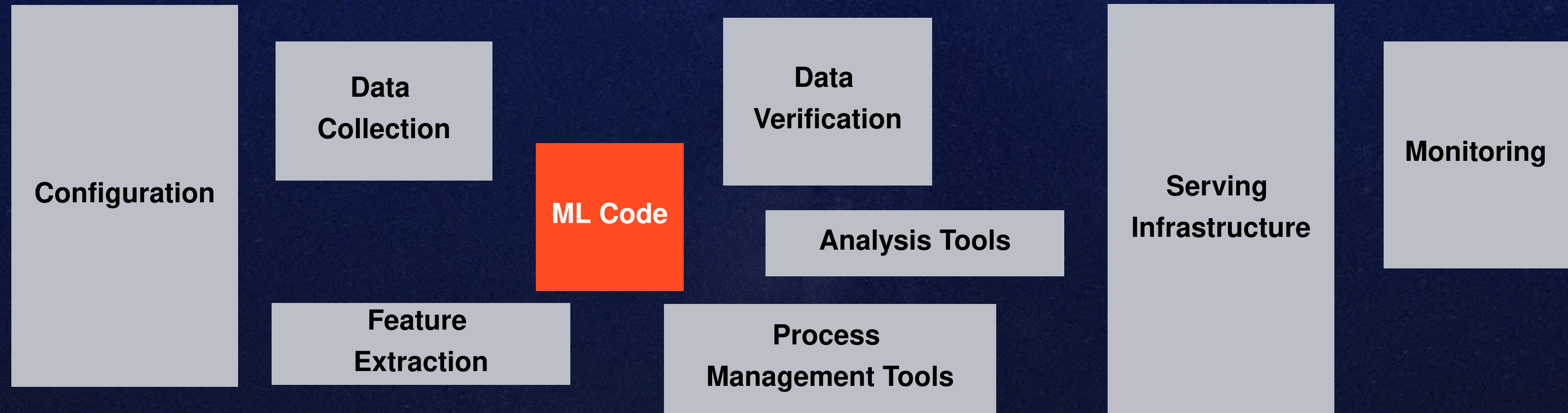
SECTION 01

# Why do we need MLOps?





# ML IS WAY MORE THAN JUST CODE



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*Sculley, D. et al. (2015) - Hidden technical debt in machine learning systems*



## MODEL LIFE - CYCLE

1

### Scoping

Define project, business goals and metrics to reach success.

2

### Data

Define data and establish baseline, label and organize data:

- different formats
- different sources

3

### Modeling

Select and train model, perform error analysis:

- feature selection/generation
- algorithm selection
- hyper-parameter tuning
- train

4

### Deployment

Deploy in production, monitor & maintain system

REPEAT



- Rate the impact of model in the business

- Version the source data and attributes

- Learn from mistakes
- Track model metrics
- Source control the code
- Checkpoints in the pipeline

- Automate validation/staged/deployment
- Deploy strategy: canary, blue/green, etc
- Monitor model:
  - Fairness
  - Model Drift



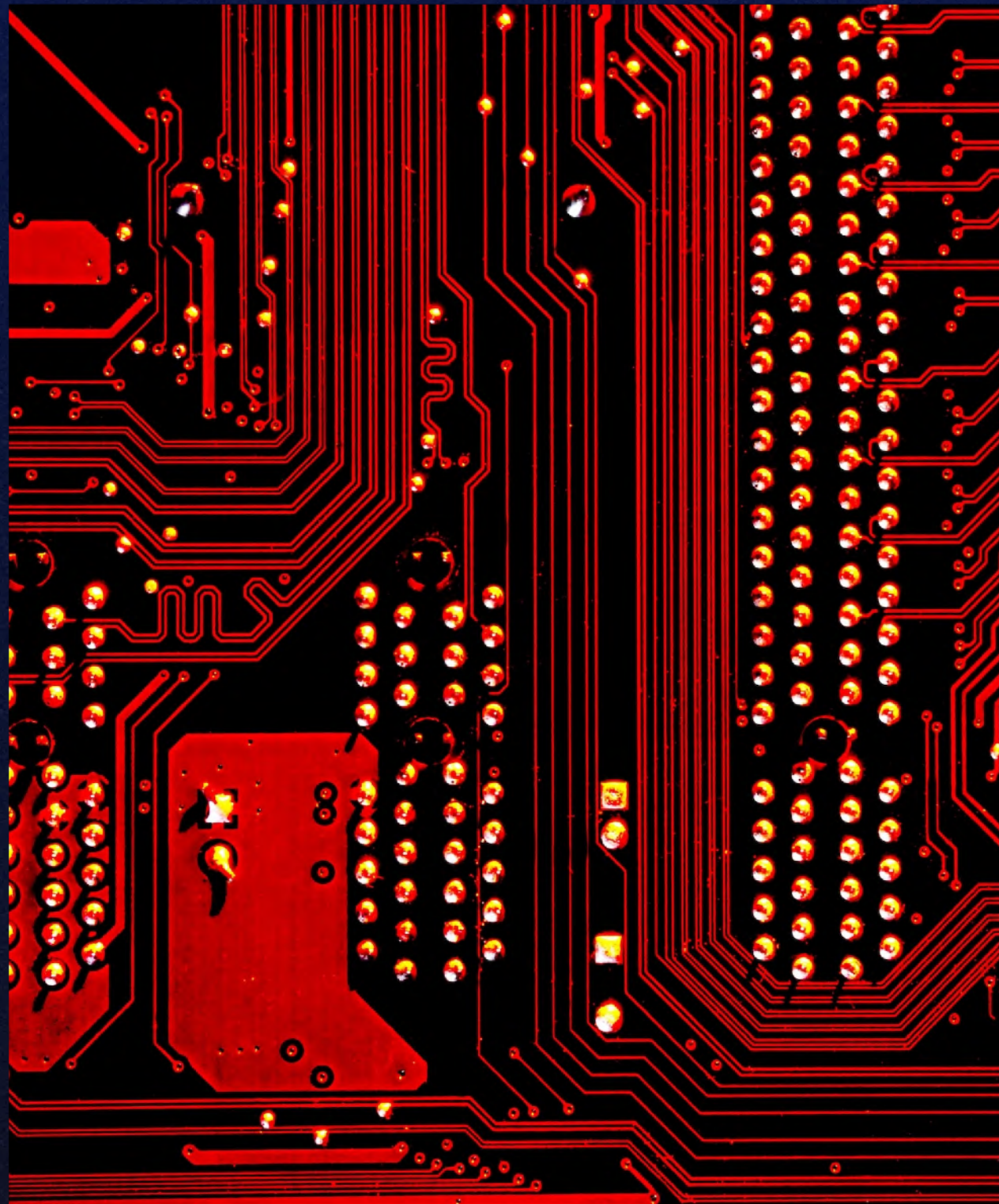


SECTION 02

# What is MLOps?







## DEFINITION

Is the standardization and streamlining of machine learning life cycle management.

It allows data scientists and machine learning engineers to collaborate and increase the pace of model development and production, by implementing continuous integration and deployment (CI/CD) practices with proper monitoring, validation, and governance of machine learning models.





## P I L L A R S



### Collaboration

People with different specialities are empowered to work together effectively.



### Provenance

For any model, we're able to track the code version, data version and parameters that went into making that model.



### Reproducibility

Both experimental and production models can be reproduced easily on-demand.



### Continuity

We can build, test, and deploy models and associated infrastructure automatically and consistently.





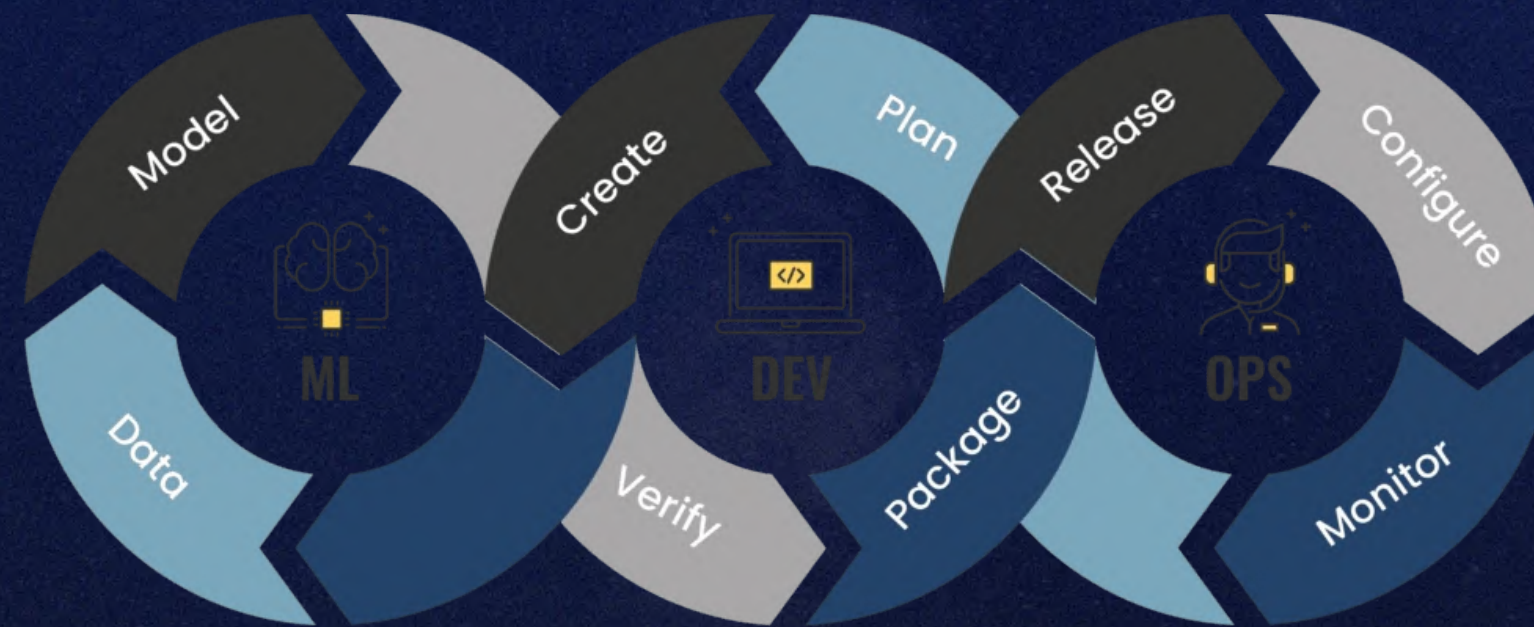
# DEVOPS VS MLOPS

## DevOps

CI-CD

Dev  
Test  
Stag  
Prod

Software Engineering



## MLOps

CI-CD + Retraining

Pipeline + Ops

Gathering  
Analysis  
Validation  
Building  
Training  
Roll-out  
Monitoring



SECTION 03

# Benefits of MLOps





## B E N E F I T S



### Reproducible pipelines

Create pipelines to implement experiments in a reproducible way



### Capture data governance

Automatic capture of governance data



### Generate alerts

Generate alerts when a human in the loop is needed



### Reusable ML environments

Enable reusable ML environments, unlock the power of cloud CPU/GPU



### Register, package and deploy

Automatic package, serve and register models



### Monitoring ML applications

Capture and monitor key metrics to ensure a valid model behavior: hardware consumption, model performance, fairness, model drift



### Automation

Automate as many steps in pipeline from business scoping to deploy





## MODEL DRIFTS



### Data drifts

Changes in data distribution that can cause poor model predictions and affect the application performance. i.e. during COVID-19 pandemic online user behavior push-limits of fraud-detection systems.



### Concept drifts

Changes in business that impact on model and may need to iterate through the pipeline to update the model to the new needs. i.e. Now is not a good idea to block purchases.





SECTION 04

# MLOps Uruguay







## Get in touch

- [mlops.uruguay@idatha.com](mailto:mlops.uruguay@idatha.com)
- <https://github.com/mlops-uruguay>
- <https://www.meetup.com/mlops-uruguay/>

## Next steps

- Request for talks  
<https://gobaldia.typeform.com/to/Sh28XWZc>