GIGALA

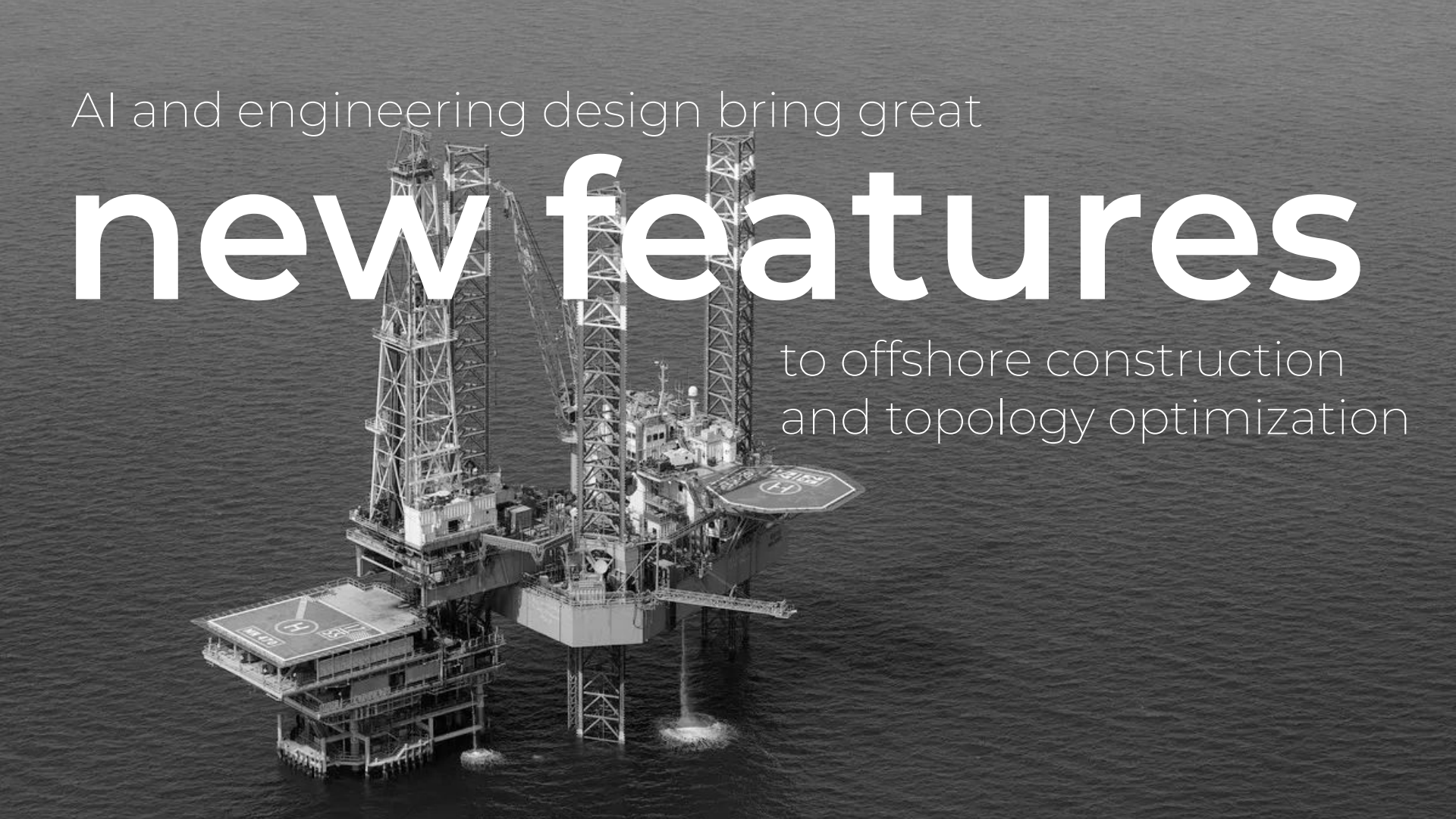
Engineering Design by
Artificial Intelligence

Giorgi Tskhondia

Hello. I am Giorgi, ex subsea pipeline installation engineer, data science professional & founder at Gigala. I combine structural engineering and artificial intelligence to optimize designs for mechanical and electrical components.

Mission

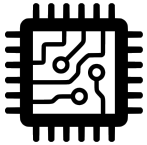
- Solving creativity to advance science and engineering
- Making AI accessible


AI and engineering design bring great
new features
to offshore construction
and topology optimization

Our expertise

OFFSHORE DYNAMICS

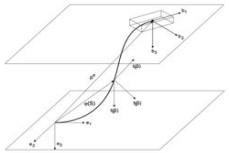
- Subsea pipelines installation
- Lifting operation
- Offshore floating wind farms
- ROV/UUV control
- Dynamic positioning with AI



TOPOLOGY OPTIMIZATION

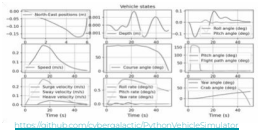
- Mechanical structures
- Electrical circuits
- MEMS
- Computer chips
- Engines

OFFSHORE DYNAMICS



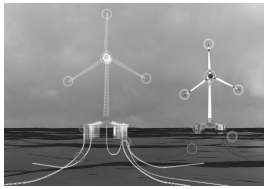
Pipelay dynamic simulation
Bending, stress and strains during pipeline installation. Design criteria in accord with DNV-OS-F101 standard.

Lifting operation automation
Lifting stability in accord with DNV-ST-H205 standard.



https://github.com/cybergalactic/PythonVehicleSimulator

Vessel motion
As input to offshore dynamics simulation.



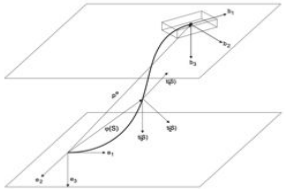
Offshore floating wind farms
Efficacy of the technology.

Subsea pipeline installation **EXPERTISE**

Certificat
Installation calculation for subsea pipelines

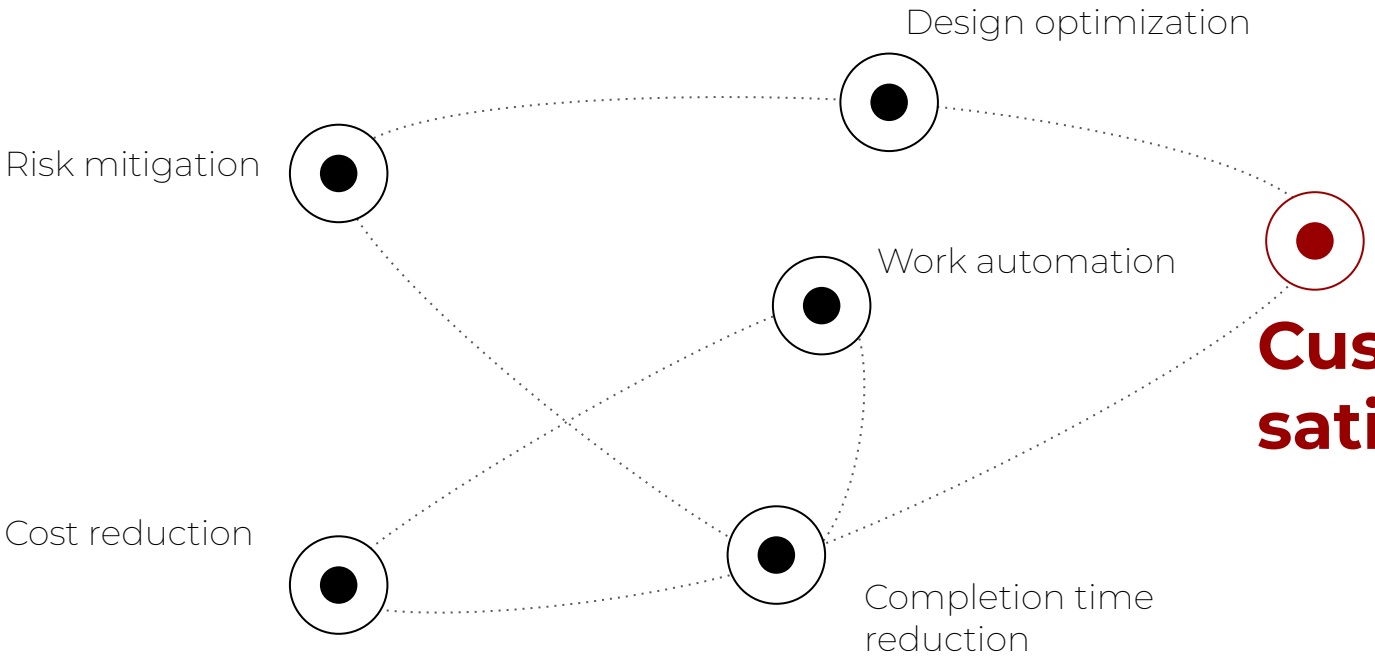
In-house MRTS Engineering's methodology

Methodology
Subsea pipelines installation analysis.



Software
Modelling offshore dynamics during construction phase

in each project we work on

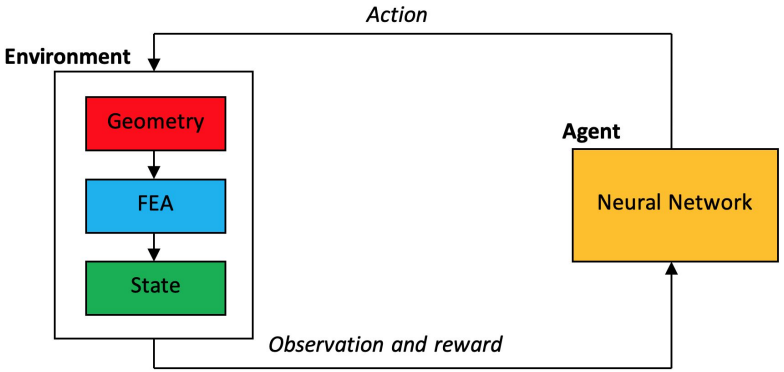


OFFSHORE DYNAMICS

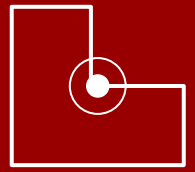
demo

You can find and try our solutions at

GitHub follow the link or QR-code



Engineering design automation *can be formulated as Markov decision process (MDP). where an engineer provides initial geometry of a structure, sets loads and allowed actions to alter the geometry, specifies the optimization objective (e.g. minimize weight, maximize stiffness), and starts training the model. After the training, in inference stage, the engineer gets her final design. This process can be augmented by recent developments in Generative AI.*



TOPOLOGY OPTIMIZATION

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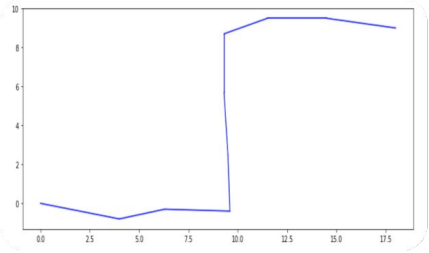
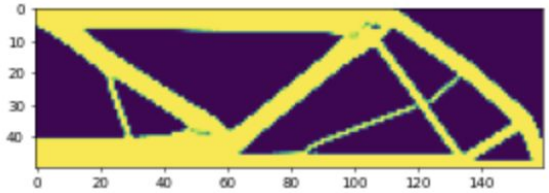
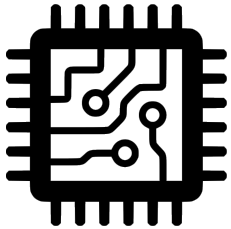
Spools



a Bridge



MEMS & Chips



Software

for topology optimization and sizing

TOPOLOGY OPTIMIZATION

demo

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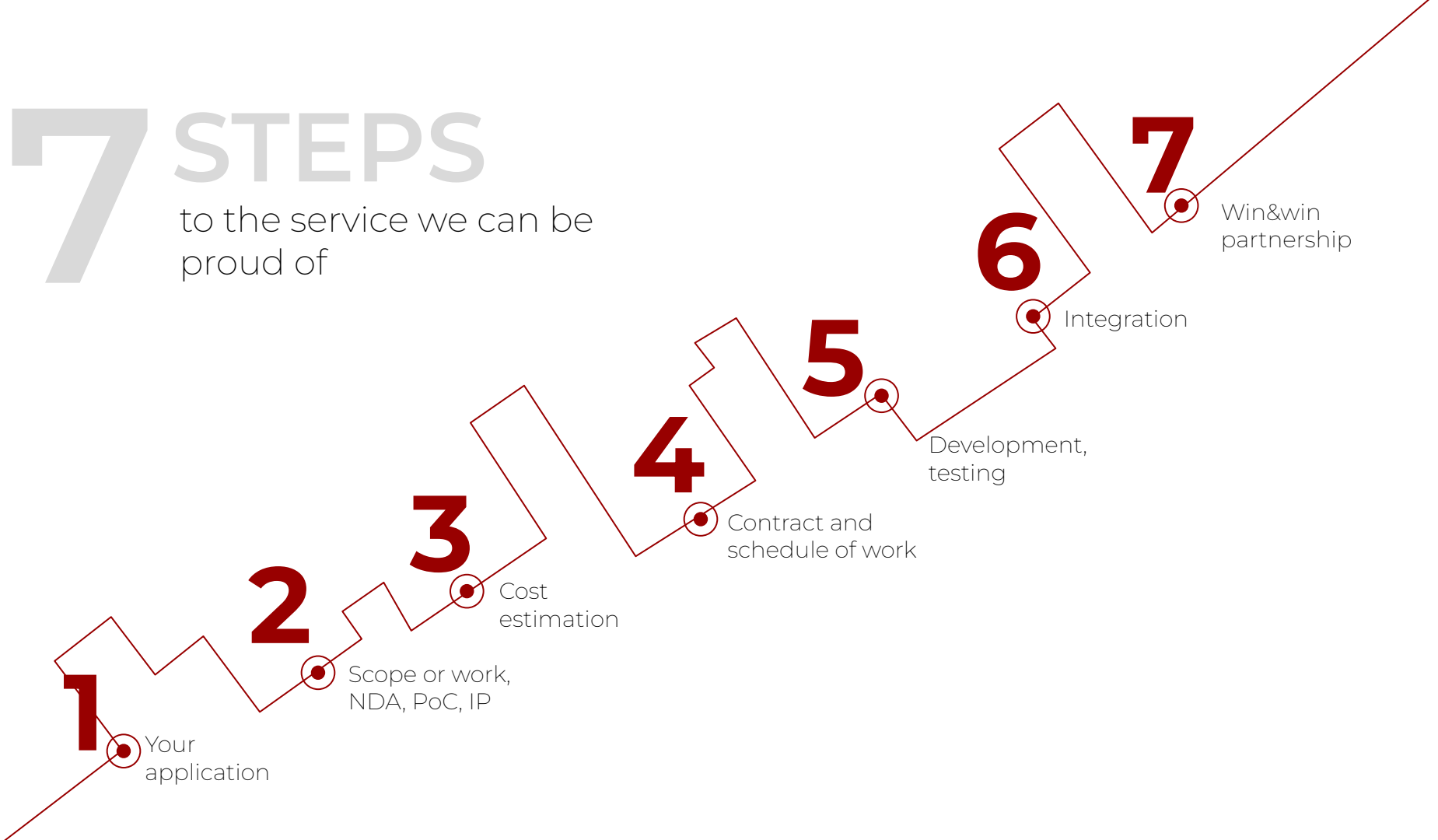
7 STEPS

to the service we can be proud of



What we do and work with

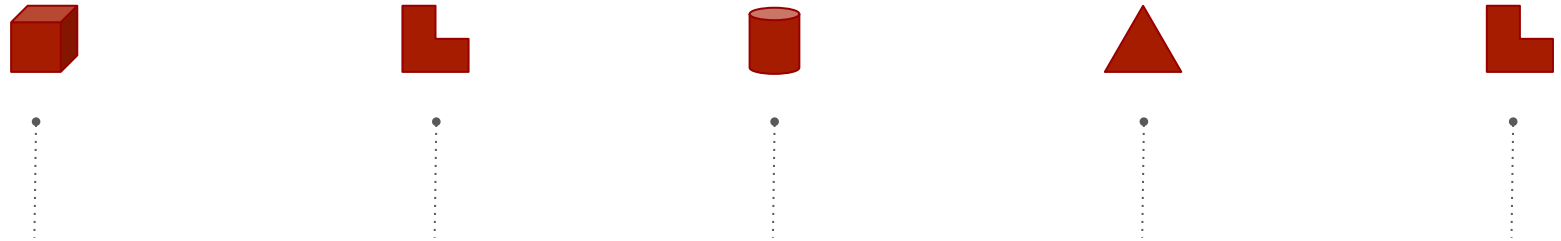
Pipelay dynamics: J-lay, S-lay

Risers, moorings, pipelines

Pipelay automation

Hardware-in-the-loop (HIL) testing for vessel control systems

Lifting operation



Offshore floating wind farms dynamics

ROV/UUV control

Vessel motion

Topology optimization

Pipelay profile optimization

Pricing on

development

- PoC cost to be discussed individually
- Project tailoring cost to be discussed individually

free

demo and sample code testing

Experience

8 years

PhD MAI'12, and offshore engineering

7 years

in data science

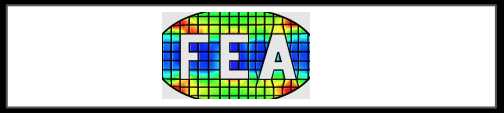
Technologies

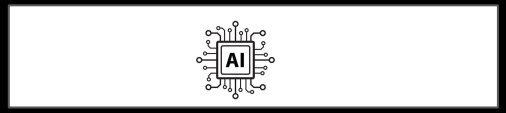
Writing high quality
CODE

State-of-the-art
TECHNOLOGIES

No/low
DATA

Verified
SIMULATION





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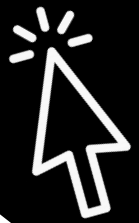

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