



**GIGALA**

Engineering Design by  
Artificial Intelligence

The background features a large, abstract geometric design. A thick, black, jagged line, resembling a mountain range or a stylized 'Z' shape, runs diagonally from the bottom left towards the top right. Overlaid on this is a thin white line that follows a similar jagged path. At three points along this white line, there are concentric circles: the first is a dotted outer circle with a solid inner circle, and the other two are solid concentric circles. These circles appear to be nodes or focal points in a circuit-like network.

Georgy Tskhondiya



Hello. I am Georgy, 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

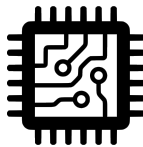


# Our expertise



## OFFSHORE DYNAMICS

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

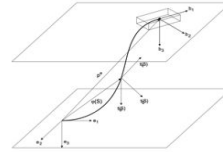


## TOPOLOGY OPTIMIZATION

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



# OFFSHORE DYNAMICS



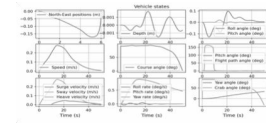
## Pipelay dynamic simulation

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



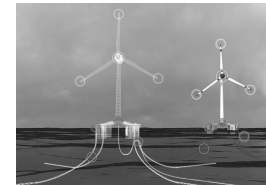
## Lifting operation automation

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



## Vessel motion

As input to offshore dynamics simulation.



## Offshore floating wind farms

Efficacy of the technology.

# Subsea pipeline installation **EXPERTISE**



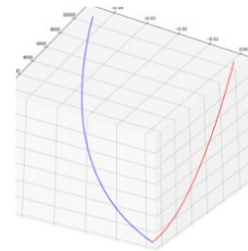
## Certificat

Installation calculation for  
subsea pipelines



## Methodology

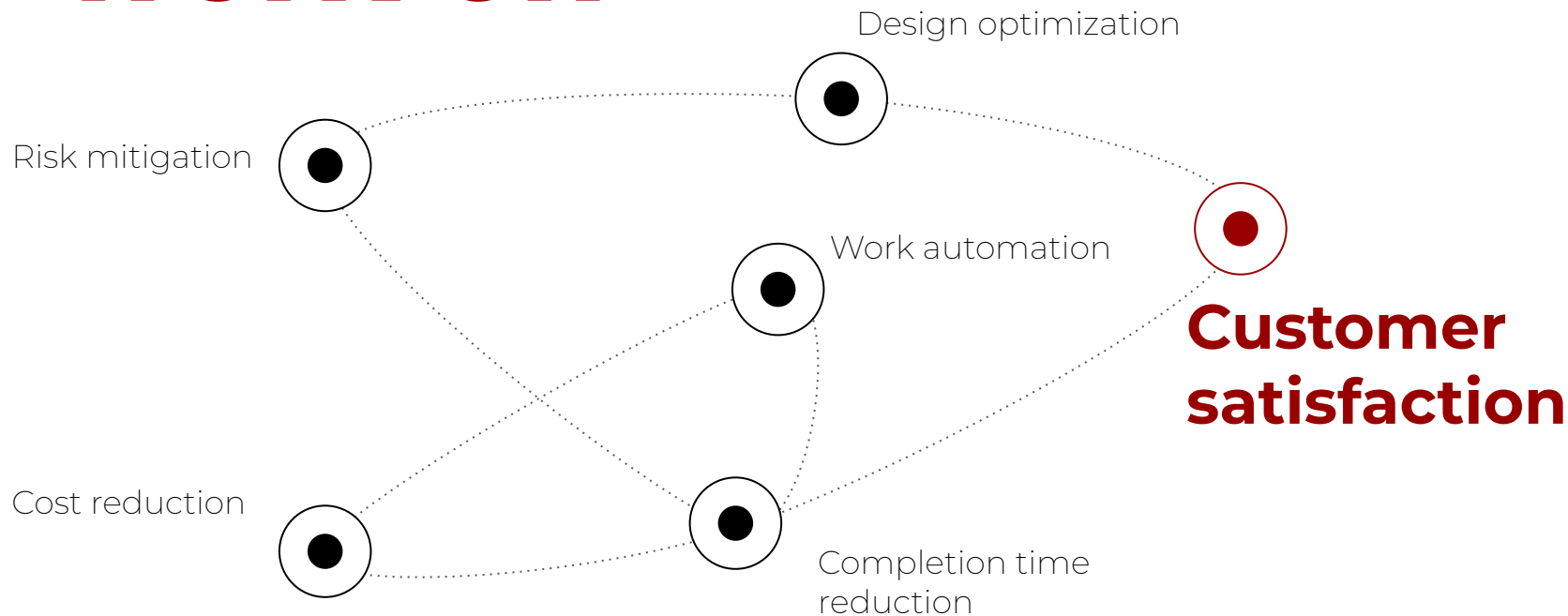
Subsea pipelines  
installation analysis



## Software

Modelling offshore dynamics  
during construction phase

# in each project we work on



# OFFSHORE DYNAMICS demo

You can find and try our solutions at

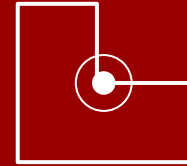
 **GitHub** [follow the link](#) or QR-code







**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

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

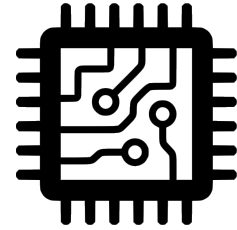
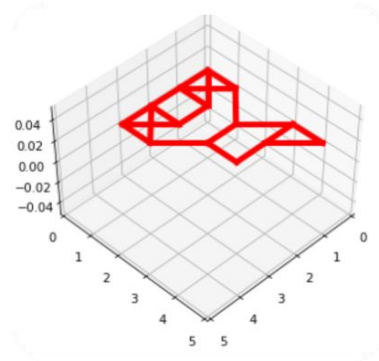
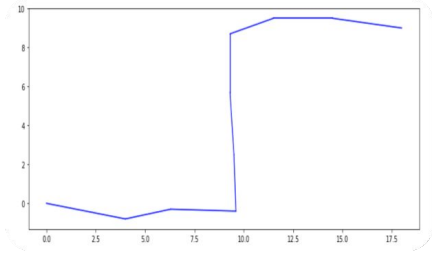
Spools



Bionic partition



MEMS & Chips



Software  
for topology optimization and sizing

# TOPOLOGY OPTIMIZATION demo

You can find and try our solution at

**GitHub** [follow the link](#) or QR-code



# 7 STEPS

to the service we can be proud of

**1** Your application

**2** Scope or work, NDA, PoC, IP

**3** Cost estimation

**4** Contract and schedule of work

**5** Development, testing

**6** Integration

**7** Win&win partnership

Pipeline dynamics: J-lay, S-lay



Risers, moorings, pipelines



Pipeline automation



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



Lifting operation



# What we do and work with

Offshore floating wind farms dynamics



ROV/UUV control



Vessel motion



Topology optimization



Pipeline profile optimization



# Pricing on development



PoC at the rate of 50\$/ hr  
per engineer



Project tailoring cost to be  
discussed individually

# free

demo and sample code  
testing

**8 years**

PhD MAI'12, and offshore  
engineering



Experience



**7 years**

in data science

# Technologies

Writing high quality  
**CODE**



State-of-the-art  
**TECHNOLOGIES**



No/low  
**DATA**





# Ready to take your design technologies to the next level? Contact us!

**FB**

<https://www.facebook.com/GigaTsk/>

**LinkedIn**

<https://linkedin.com/in/gigatskhondia>

[gigatskhondia@gmail.com](mailto:gigatskhondia@gmail.com)



Visit our website  
[Gigala.io](https://Gigala.io)