Naturally curious and energetic, I strive for knowledge and challenges. I feel most happy when I get out of my comfort zone and expand my skills by engaging in new engineering fields. My work experience in a variety of industries includes: pulp & paper, mining, steel production, district heating, railway (infrastructure and rolling stock), military air fleets, hauling vehicles, HVAC systems, NDT ultrasonic testing, and cybersecurity.

I've had major participation pproducts, innovations and tools related to computer vision systems, LIDAR processing and simulation, control systems, ultrasonic NDT, and Extended Reality between others.

For details on my projects, products, keywords, publications, and more, please visit my personal site at <https://migcasta.github.io> Please, notice that I started the web in September 2022. I do daily updates in the web, which has a lot of material, but only a fraction of my work is currently showcased.

I'm proud of my hobbies, which are based on striving for incremental improvements and which challenge me both physically and mentally. I can solve Rubik's cube blindfolded. I can grind over rails with inlines. I can tell stories of hundreds of divinities in the Norse, Greek and Egyptian mythologies. I can do acrobatic aerial yoga (yes, like Pink popularized). I have an army of hobby figures which I've been painting and maintaining for 25 years. Thanks to my 3 years old child, I can identify over 60 species of dinosaurs. Don't ask me about any of these hobbies, or I will try to hook you in.

# In Computer Vision systems:

- A system for the detection of faults in railway catenaries using cameras mounted on trains.

- A system for autonomous navigation of drones in mine tunnels using an on-board camera.

- A system for context-based retrieval of images in large scale databases.

# In LIDAR processing and simulation:

- A syntehtic data generator which simulates drones flying in undergorund mines.

- Algorithms for junction recognition in underground mines.

- Segmentation and 3D modeling algorithms for the railway infrastructure.

# In Control Systems for industrial processes:

- A variety of tools for control configuration selection, including optimization tools, data-driven design tools and modeling tools. The most notable tool is ProMoVis, which was one of the first tools to be integrated in the app store of the ABB systems.

- A variety of process models for the pulp and paper industry.

- Educational simulators.

# Tools in ultrasonic NDT for the detection of subsurface defects in:

- Thin multi-layered materials.

- Railway crossings.

# In behavioral biometrics: An AI to detect abnormal behavior of cats during unsupervised walks wearing a GPS collar.

# In VR and AR: support systems for maintenance of railway infrastructures.

# In e-publishing: An AI system for Expertise Matching in conferences, which performs an optimal assignment of review tasks.