Yohan Le Gars

Profile

French student with an international mindset who is strongly motivated in becoming a competent engineer in robotics and machine perception.

Skills & Interests

- ✔ Python (PyTorch, Tensorflow, NumPy)
- ✔ C++
- ✔ ROS, ROS 2
- ✔ Deep Learning and Machine Learning
- ✔ Computer Vision
- ✔ Motion Planning
- ✔ Simultaneous Localization and Mapping
- ✔ Matlab
- ✔ Linux
- ✔ French, English

Contact

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Experience

Feb 2023 - Aug 2023	**Stereolabs** R&D intern, Paris (FR) Isaac Sim, Spatial Mapping, Terrain Mapping, ROS 2
Feb 2021 - Aug 2021	**Surgical Robotics Lab** Research Assistant, Enschede (NL) worked on the published paper: Locomotion of bovine spermatozoa during the transition from individual cells to bundles
Aug 2020 - Nov 2020	**Forvia/Faurecia** PLC Programmer intern, Gorzów Wielkopolski (PL) LAD programming (TIA Portal) + HMI with Siemens and Universal robots for a manufacturing station inside the plant.

Education

2021 - Present	**MSc Robotics** TU Delft, Delft (NL) The MSc Robotics is situated at the intersection of mechanical engineering and artificial intelligence. **Minor : Computer Vision & Deep Learning**
2016 - 2021	**BSc Advanced Technology** University of Twente , Enschede (NL) General Engineering Mechanics, Thermodynamics, Fluid Mechanics, Dynamics, Electronics, Fields & Waves, Control theory. For each discipline a challenging project work is required.
2014 - 2016	**High school - French Baccalauréat** Lycée Français Victor Hugo, Frankfurt (DE)

Additional activities

- ⚡ **Sport & Fitness enthusiast**
- ⚡ **DIY embedded systems projects**

Projects

2022 **A MONITORING MOBILE MANIPULATOR**
TU Delft
- Developed a software solution on ROS to achieve autonomous monitoring using a mobile manipulator
- Developped a state machine that is linked to all ROS nodes
- Developped a GUI with Qt5 to allow the operator to give new 2D locations for the mobile robot to reach and 3D points that the camera (hold by the manipulator) must record
- Human detections using Lidar and camera sensors.
- Motion planning and motion control for the manipulator using MoveIt package

2022 **HAND SIGNS DETECTION WITH LOTTERY TICKET HYPOTHESIS**
TU Delft
- Annotation of hand sign pictures using Roboflow
- Train the YOLOv5 model on google cloud platform
- Apply quantization and weights pruning to reduce model size and increase running speed
- Deploy the light weight model on a 2Gb RAM raspberry pi controlled mobile robot

2022 **3D HEAD RECONSTRUCTION**
TU Delft
- Reproducibility project from scratch of a deep learning paper:
  H3D-Net: Few-Shot High-Fidelity 3D Head Reconstruction.

2022 **PEDESTRIAN RECOGNITION & LOCALIZATION**
TU Delft
- Developed a machine learning algorithm to detect and localize pedestrians in 3D using monocular camera sensor and ground plane assumptions.
- Improved the algorithm using LiDAR point clouds, clustered using DBSCAN, for regions proposals.

2022 **PATH PLANNING & TRAJECTORY SMOOTHING**
TU Delft
- Developed Informed RRT and RRT* from scratch for a mobile robot.
- Applied cubic spline interpolation to obtain a smooth trajectory between the waypoints

2021 **OBSTACLE AVOIDANCE & PEDESTRIAN DETECTION FOR A SELF-DRIVING CAR**
TU Delft
- Developed a collection of ROS nodes, each tackling a different task, to achieve autonomous driving in a simulated test track.
- Designed two nodes to detect obstacles and pedestrians from the camera images and lidar point clouds using OpenCV and PCL.
- Developed a node that used these detections to generate control instructions.

2021 **ARTIFICIAL NEURAL NETWORK FOR A RACING GAME**
TU Delft
- Developed and trained a Neural Network for multi-class classification that used the top-view of a 2D racing game as input and outputted the control action (accelerate, steer, left/right, brake)

2021 **BACHELOR THESIS: INFLUENCE OF BOVINE SPERMATOZOA BUNDLING ON FLAGELLAR WAVE PROPAGATION**
Surgical Robotics Laboratory, Twente
- Mathematical analysis of flagellar wave propagation of bovine sperm cells from two videoscopies for soft robotics application.

2021   **CONTROL SEGWAY**
University of Twente
- Modelled the dynamics of a segway as an inverted pendulum using 20-sim and bond graphs theories.
- Developed a LQR state feedback controller.

2020   **ANTENNA AND FM TRANSMITTER**
University of Twente
- Developed a FM transmitter Colpritts harmonic oscillator circuit.
- Developed a helical antenna with 43 MHz resonant frequency. In the initial stages, an analytical and numerical description is performed using COMSOL.

2019   **A ROBOTIC ARM THAT CUTS CAKES**
University of Twente
- Developed a robotic arm powered by 2 DC motors. EMG signals from the upper limb's muscles are used as the control interface between the user and the robot. The robot is designed for people suffering from Duchenne muscular dystrophy