Henallux-Engineering school Pierrard

Introduction to Intelligent Systems

Master 1 auto | 2024-2025

Corentin Domken

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General presentation

General presentation

- Number of hours: 45 hours (80% => **36h**)
- Number of credits: 4
- Evaluation method:
  - 30% Project presentation
  - 10% Group defense
  - 20% Individual defense
  - 40% Final report
- Slides in English, English software, oral presentation in English
- Exam in English (Possible discussion in French)
- The content of this course : fiche UE, slides, Notebooks & Moodle

SI course Plan

Theory

- Courses on theory
- Overview on basics of softwares and tools

Exploration

- Explore equipment

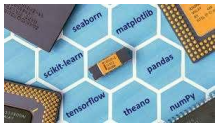
Project

- Propose and realise a project

Theory and exploration

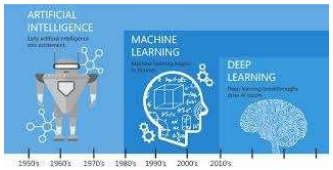
Theory and practice

- Python Virtual environment (learnt implicitly)
  - Matplotlib, numpy, seaborn, pandas, sklearn, OpenCV
- Initiation to Computer vision with python
  - Image processing
  - Video processing
- Intuition on Deep Learning applied in Computer Vision
  - Introduction to DL
  - Main difference between DL and classic ML
  - TD : DL applied to CV
- Git
  - What is a distributed version control system
  - Git basic operations: locally and remotely
  - Working on groups on the same project using git



OpenCV

python™



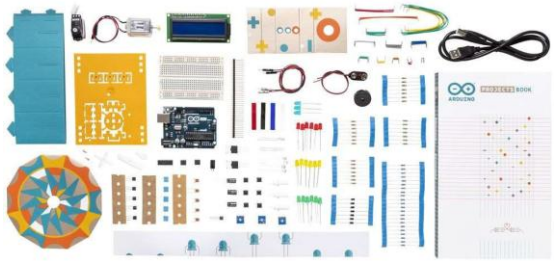
git

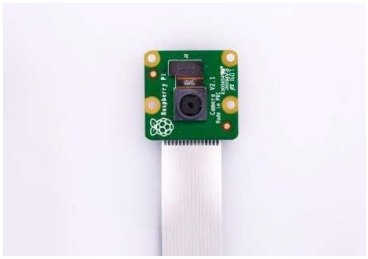
Material exploration

- Equipment:
  - Raspberry Pi
  - Arduino Starter kit
  - Pi camera
  - Niryo

- Group of 2 students
- Deposit of 50 € / student for the borrowing of the material
- To be returned on the day of the exam

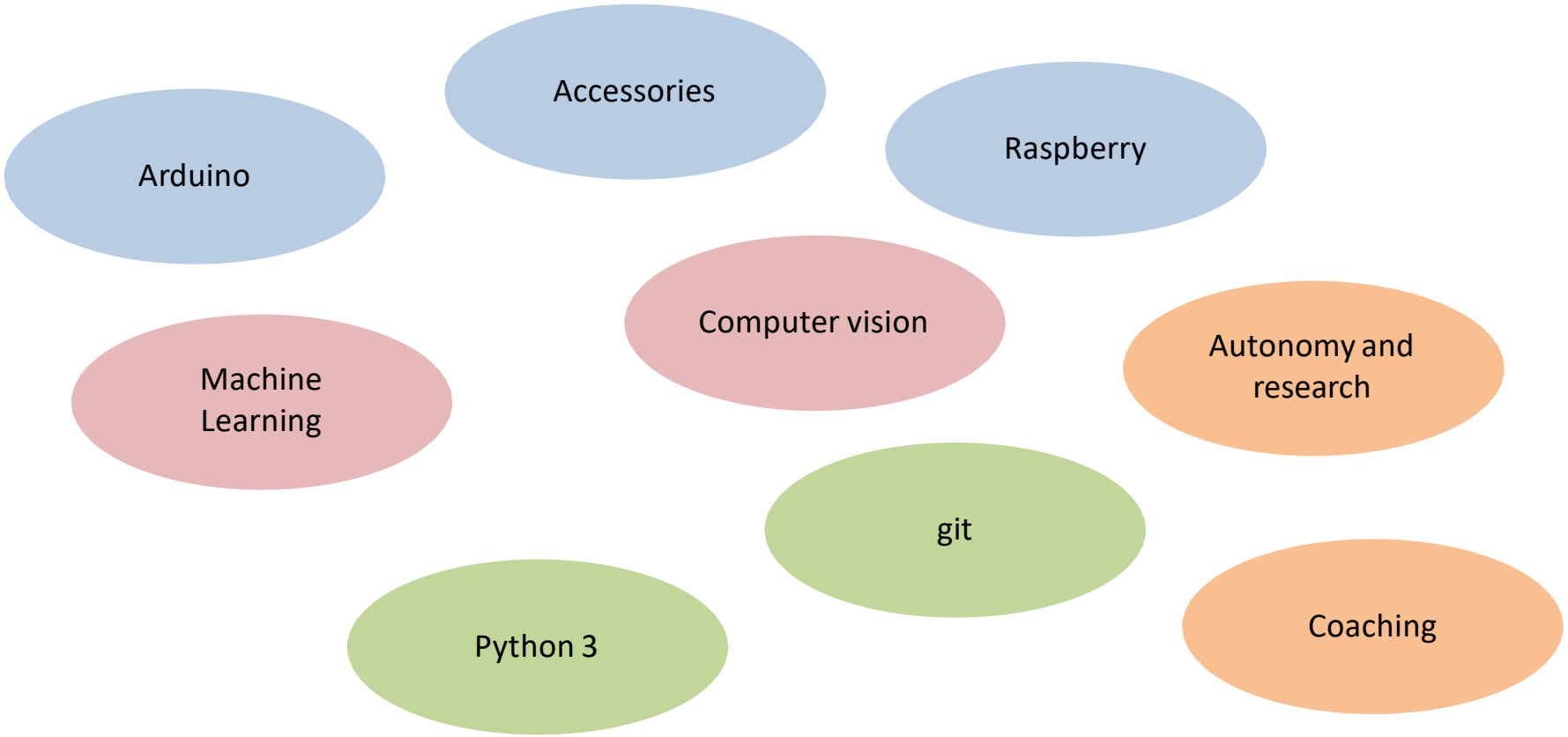
- Explore some projects on Raspberry or Arduino





Project

Project with artificial intelligence!



Project

Project SI (2019-2020)	

Part 1 : Analyse	• Before carrying out your work, an analysis must be carried out (in the form of a document and presentation).
	• This analysis will resume:
	  • A description of the project
	  • A description of the equipment required
	  • A diagram of the project
	  • The distribution of tasks within the group
	  • A time line with validation steps
	  • A state of the art of the existing (code, web page ...), reviews and reuse plan

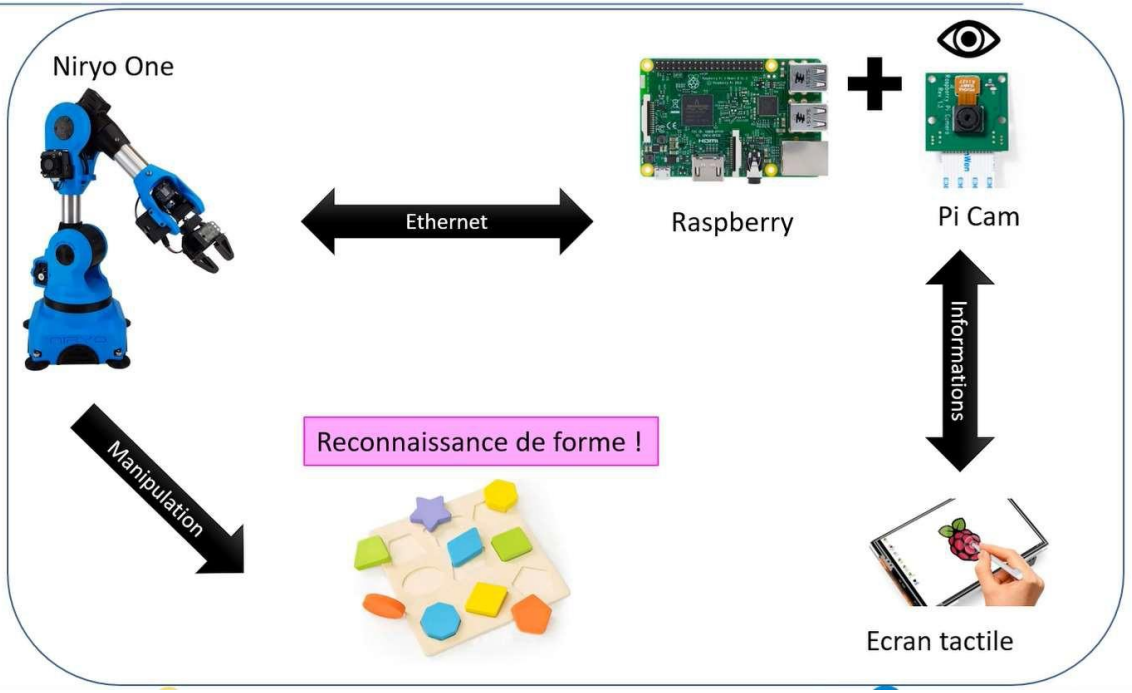
Part 2 : Realisation	• Install and use git for tracing documents and code! • Do the needed code • Accuracy of the result • Hardware optimization • Intermediate application • Final application
Presentation	Presentation & defense
	Report

Projects of last years!

- Automatisation d'un robot 6 axes
- Borne de jeux arcades avec assistance intelligente
- Reconnaissance de plaques d'immatriculation
- Robot tondeuse
- Emotional recognition
- Sign language translator

Projects of last years!

Automatisation d'un robot 6 axes



Projects of last years!

Reconnaissance de plaques d'immatriculation

➢ Détection de plaques d'immatriculation belges

Raspberry + Pi Cam

Communication

Arduino

Reconnaissance de chiffres et de lettres !

- Affichage de la plaque sur un LCD
- Reconnaitre une plaque d'immatriculation Belge
- Clignotement d'un feu lumineux lors de l'activation de la barrière

Projects of last years!

Borne de jeux arcades avec assistance intelligente

Console de jeux

Raspberry Pi (1)

Joystick

Système d'exploitation

Interaction avec le Jeux par reconnaissance de gestes

Raspberry Pi (2)

Reconnaissance de gestes !

Pi Cam

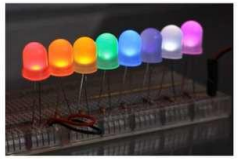
Un geste

Jeux de lumière intéragissant avec le son

Arduino

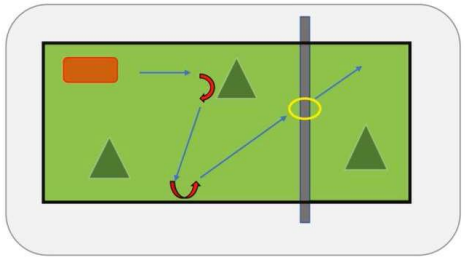
Capteur son

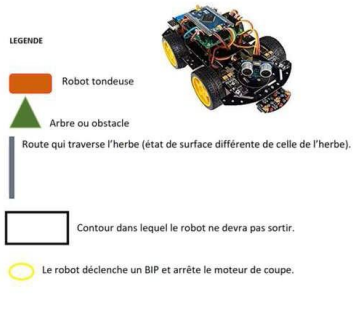
musique



Projects of last years!

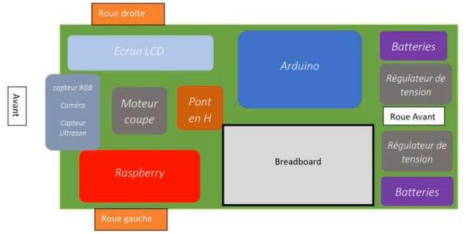
Robot tondeuse





Reconnaissance de texture !

Zoom sur le Robot



Dr. Rim Slama

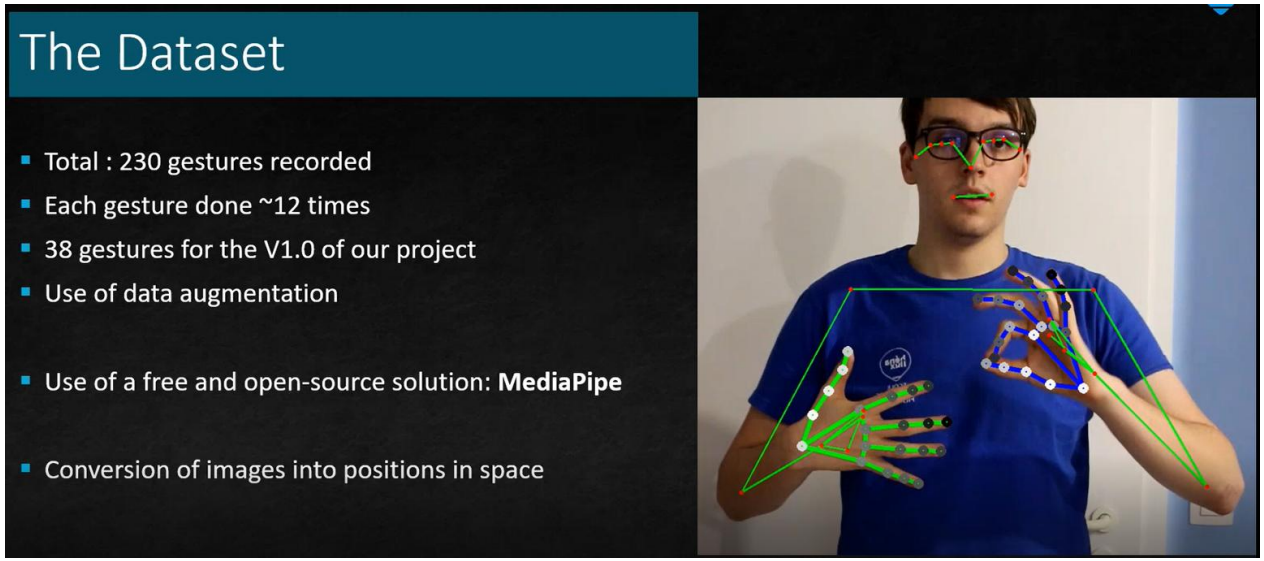
Henallux-Engineering school Pi

Projects of last years!

Emotional recognition

Projects of last years!

Sign language translator



Questions