Clément Pinard
Ph.D.

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Work Experience

Entrust (ex Onfido) (Paris, France)
Senior Applied Scientist (2024 – present)
Computer Vision solutions for detecting fraudulent documents within Onfido's document capture SDK

XXII (Puteaux – La Défense, France)
Computer Vision Scientist (2022 – 2024)
Computer Vision solutions for security cameras, especially object detection and tracking

Contentsquare (Paris, France)
Data Scientist (2021 – 2022)
Web page contextualization for automatic page and html elements classification

Upstride (Paris, France)
Research scientist (2021)
Applying Geometric Algebra on convolutional neural networks for semantic segmentation

ENSTA Paris (Palaiseau, France)
Research Engineer, (2019 – 2020)
Constructing a dataset for depth map evaluation in the context of obstacle avoidance for a monocular stabilized flying camera

Parrot Drones (Paris, France)
Phd Student (with ENSTA Paris) (2016 – 2019)

Computer Vision Intern (2015)
Designing and implementing an algorithm for vision-based localization with a known target for embedded system

Technip (Kuala Lumpur, Malaysia)
Knowledege management intern (2014)
Designing and administrating a knowledge management platform tool for project managers, from tender to product shipping

Civolution, now part of Kudelski Group (Rennes, France)
Software Engineering Intern (2013 – 2014)
Modifying *x264* encoder to include Nexguard Watermarking plugin within the encoding process

Education

ENSTA Paris (Palaiseau, France)
Ph.D., Computer Vision, (2016 – 2019)
supervised by Antoine Manzanera
Robust Learning of a depth map for obstacle avoidance with a monocular stabilized flying camera

Centrale-Supelec (Gif sur Yvette, France)
MEng (2011 – 2015)
Student in a leading Engineering School in the fields of electrical energy and information sciences
Speciality in Electronic Systems, Networks & Images

Collège Stanislas (Paris, France)
*Classe préparatoire aux Grandes Ecoles - MP** (2009 – 2011)

Lycée Alain Fournier (Bourges, France)
Classe préparatoire aux Grandes Ecoles - MPSI (2008 – 2009)

Languages

French (native), English (fluent)

Skills and technologies

Python, C/C++, CUDA, Lua
PyTorch, Torch, Numpy, OpenCV, PCL

Research Interests

I am particularly interested in Computer Vision, Deep Learning, and 3D Geometry. The past focus of my research was training a neural network to generate a depth map from monocular aerial footage, with a focus on robustness. This work has been supervised by both ENSTA Paris and Parrot Drones and is aimed at obstacle avoidance for consumer UAVs. More recently, I worked on trying to improve neural networks with geometric algebra in the company Upstride and on providing dataset manipulation tools in XXII, which aims at applying computer for security cameras. I am currently working at Onfido, an Entrust company. In particular, I am working on a fraudulent document classifier, using 10 years of uploaded photos of documents from all over the world to automatically detect fake documents.

Publications

Does it work outside this benchmark? Introducing the Rigid Depth Constructor tool, depth validation dataset construction in rigid scenes for the masses.
`https://clementpinard.fr/rigid_depth_constructor`

We present a framework for creating depth-enabled images with a Lidar scanner. The tool aims to be the most flexible and user-friendly possible

Robust Learning of a depth map for obstacle avoidance with a monocular stabilized flying camera
`https://clementpinard.fr/phd_thesis`

Original title *Apprentissage robuste d'une carte de profondeur pour l'évitement d'obstacle dans le cas des caméras volantes, monoculaires et stabilisées.* PhD defended in June 2019

Learning structure-from-motion *from motion*
Clément Pinard, Laure Chevalley, Antoine Manzanera and David Filliat
GMDL Workshop @ ECCV2018
`https://clementpinard.fr/unsupervised_depthnet/`

This work questions the quality metrics used by deep neural networks performing depth prediction from a single image, and the usability of published works on unsupervised learning of depth from videos. In contrast, we propose to learn in the same unsupervised manner a variation of DepthNet, presented in our previous work, which is more suitable for robustness.

End-to-end depth from motion with stabilized monocular videos
Clément Pinard, Laure Chevalley, Antoine Manzanera and David Filliat
UAV-g 2017 (Oral)
`https://clementpinard.fr/depthnet`
`https://stillbox.ensta.fr`

We present DepthNet, a fully convolutional neural network. This is a depth map inference system from monocular-stabilized videos based on a novel dataset for navigation that mimics drone footage

Multi range Real-time depth inference from a monocular stabilized footage using a Fully Convolutional Neural Network
Clément Pinard, Laure Chevalley, Antoine Manzanera and David Filliat
ECMR 2017 (Poster Session)
`https://hal.archives-ouvertes.fr/hal-01587658`

Inspired from HDR imaging, we propose a multi-range architecture for unconstrained UAV flight, leveraging flight data from sensors to make accurate depth maps for arbitrary long range.

The last two publications resulted in a patent filing by Parrot Drones in 2017

References

Antoine Manzanera - Ph.D. advisor
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David Filliat - Ph.D. advisor and head of the U2IS lab
david.filliat@ensta-paris.fr
Laure Chevalley - Former Head of Flight Vision team at Parrot Drones
laure.chevalley@parrot.com