

The machine intelligence of images.

MVA S2 2024

The machine intelligence of images

A deep dive inside cameras from an academic to an industrial viewpoint



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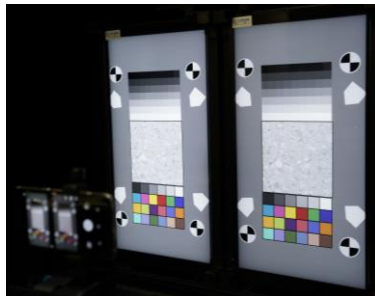
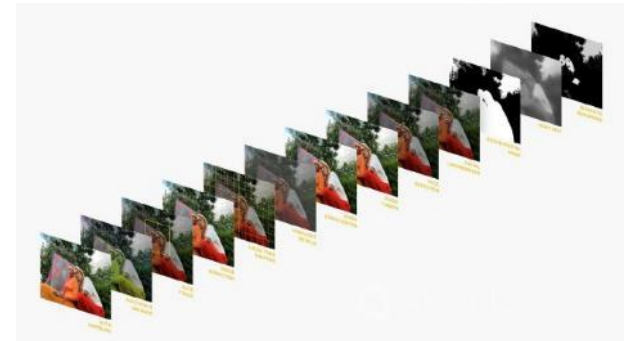
Why should you follow this course?

- Touch the complexity of a smartphone cameras
- Need of understanding all components : hardware, chipset, software, algo, ...
- How academic work can be leveraged into smartphones
- Complexity of measuring performance of an imaging algorithm for photography

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What will we cover ?

- Introduction to cameras and the industrial ecosystem
- The image pipe (algorithms chain) from RAW to Final Image
- DSLR vs Smartphone – the sensitivity and denoising challenge, Multi-Images / Multi-Sensors
- Introduction to Image Quality Analysis and Image Tuning
- IA within the processing pipe, and how IA can help to measure the quality



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Quand?

Mercredi Matin, 9h30-12h30

- Cours (6 x 3h) et TPs (3 x 3h)
- Pour les TPs venir avec un ordinateur portable.

Où?

- Ecole Normale Supérieure Paris-Saclay – Salle 1M07
- Une session (6 Novembre) dans les locaux de DXOMARK
[24 quai Alphonse Le Gallo, Boulogne Billancourt](#)

Validation

- Exercices de TP à rendre (3 TPs) (coef 1/2)
- Un mini-project par groupe, relatif au rétro-engineering d'un traitement d'image (coef. 1/2):
 - Analyse de la fonction
 - Préparation d'une présentation orale (15min)
 - Soumission de la présentation et du code produit
 - Les élèves seront plutôt jugés sur la démarche que le résultat.

Session	Date, Heure	Lieu
Introduction to cameras and the industrial ecosystem	09/10/2024	Saclay 1M07
DSLR vs Smartphone – the sensitivity and denoising challenge	16/10/2024	Saclay 1M07
TP Image Pipeline – Essentials and practical	23/10/2024	Saclay 1M07
Image Quality Analysis from RAW to Final Image quality	30/10/2024	Saclay 1M07
DXOMARK Lab Tours and Image Quality TP	06/11/2024	Boulogne
Color Processing, HDR Format	13/11/2024	Saclay 1M07
Image Quality Tuning	20/11/2024	Saclay 1M07
IA from cameras to IQ evaluation	27/11/2024	Saclay 1M07
TP – IQA & Datasets	11/12/2024	Saclay 1M07
	<i>Forum MVA</i>	04/12/2024
Mini Projects Presentation	18/12/2024	Remote