Graduate Summer School: Computer Vision

Monday July 22, 2013

8:00–8:45 *Check-In/Light Breakfast (Hosted by IPAM)*

8:45–9:00 *Welcome and Opening Remarks*

9:00–10:00 **Alan Yuille** (University of California, Los Angeles (UCLA))
What is Vision and Why is it Hard?

10:00–10:30 *Break*

10:30–11:30 **Iasonas Kokkinos** (École Centrale de Paris)
Introduction to Linear Image Processing

11:30–12:00 *Break*

12:00–1:00 **Iasonas Kokkinos** (École Centrale de Paris)
Introduction to Non-Linear Image Processing

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Ying Nian Wu** (University of California, Los Angeles (UCLA))
Probabilistic Models for Images: Markov Random Fields and basic sampling. Applications to image segmentation and texture modeling

3:30–4:00 *Break*

4:00–5:00 **Yuri Boykov** (University of Western Ontario)
Introduction to Image Segmentation: Part 1a

5:00–6:30 *Reception (Location: IPAM Lobby)*

Tuesday July 23, 2013

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Mila Nikolova** (École Normale Supérieure de Cachan)
Inverse Modelling using Optimization, Part I

10:00–10:30 *Break*

10:30–11:30 **Yuri Boykov** (University of Western Ontario)
Introduction to Image Segmentation: Part 1b

11:30–12:00 *Break*

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12:00–1:00 **Mila Nikolova** (École Normale Supérieure de Cachan)
Inverse Modelling using Optimization, Part II

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Yuri Boykov** (University of Western Ontario)
Multi-label segmentation and high-order constraints

3:30–4:00 *Break*

4:00–5:00 **Mila Nikolova** (École Normale Supérieure de Cachan)
Inverse Modelling using Optimization, Part III

Wednesday July 24, 2013

8:00–9:00 *Continental Breakfast*

9:00–10:00 **William Freeman** (Massachusetts Institute of Technology)
Belief propagation and patch-based image analysis

10:00–10:30 *Break*

10:30–11:30 **William Freeman** (Massachusetts Institute of Technology)
Computational Photography

11:30–12:00 *Break*

12:00–1:00 **Jason Corso** (SUNY Buffalo)
Agglomerative and Hierarchical Grouping and Segmentation in Space and Space-Time

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Yuri Boykov** (University of Western Ontario)
Model fitting and regularization (discrete optimization approach)

3:30–4:00 *Break*

4:00–5:00 **Iasonas Kokkinos** (École Centrale de Paris)
Introduction to Motion Correspondence

Thursday July 25, 2013

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Iasonas Kokkinos** (École Centrale de Paris)
Interest Point Detectors and Descriptors

10:00–10:30 *Break*

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10:30–11:30 **Jason Corso** (SUNY Buffalo)
Low-Level Features and Descriptors in Video

11:30–12:00 *Break*

12:00–1:00 **Ying Nian Wu** (University of California, Los Angeles (UCLA))
Sparsity and Active Bases

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Alan Yuille** (University of California, Los Angeles (UCLA))
Brief Introduction to Geometry and Vision

3:30–4:00 *Break*

4:00–5:00 **Jason Corso** (SUNY Buffalo)
Vision and Language

Friday July 26, 2013

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Richard Szeliski** (Microsoft Research)
Image Stitching

10:00–10:30 *Break*

10:30–11:30 **Richard Szeliski** (Microsoft Research)
Image-based Rendering and Modeling

11:30–12:00 *Break*

12:00–1:00 **Richard Szeliski** (Microsoft Research)
Internet-Scale 3D modeling - Rome in a Day

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Alan Yuille** (University of California, Los Angeles (UCLA))
How to Write a Good Paper

3:30–4:00 *Break*

4:00–5:00 **Alan Yuille** (University of California, Los Angeles (UCLA))
How to Read a Paper Critically

Monday July 29, 2013

8:00–9:00	*Continental Breakfast*
9:00–10:00	**Daniel Cremers** (Technische Universtitat München) *Variational Methods and PDE's for Image Analysis*
10:00–10:30	*Break*
10:30–11:30	**Daniel Cremers** (Technische Universtitat München) *Convex Optimization and Image Segmentation*
11:30–12:00	*Break*
11:50–2:30	*Korf Lectures: Moore Hall 100*
12:00–1:00	**Richard Korf** (University of California, Los Angeles (UCLA)) *Heuristic Search I*
1:00–2:30	*Lunch (on your own)*
2:30–3:30	**Richard Korf** (University of California, Los Angeles (UCLA)) *Heuristic Search II*
3:30–4:00	*Break*
3:50–5:00	*Yuille Lecture: UCLA Faculty Center*
4:00–5:00	**Alan Yuille** (University of California, Los Angeles (UCLA)) *Search and Vision*

Tuesday July 30, 2013

8:00–9:00	*Continental Breakfast*
9:00–10:00	**Daniel Cremers** (Technische Universtitat München) *Multiple View Reconstruction*
10:00–10:30	*Break*
10:30–11:30	**Daniel Cremers** (Technische Universtitat München) *Optical Flow and Dense Correspondence*
11:30–12:00	*Break*

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12:00–1:00 **Rob Fergus** (New York University)
An Introduction to Deep Learning for Vision

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Rob Fergus** (New York University)
Training Large Convolutional Neural Network Models for Image Classification

3:30–4:00 *Break*

4:00–5:00 **Rob Fergus** (New York University)
Deconvolutional Networks

Wednesday July 31, 2013

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Stanley Osher** (University of California, Los Angeles (UCLA))
Level Sets and TV-norms

10:00–10:30 *Break*

10:30–11:30 **Stanley Osher** (University of California, Los Angeles (UCLA))
Split-Bregman

11:30–12:00 *Break*

12:00–1:00 **Ying Nian Wu** (University of California, Los Angeles (UCLA))
Introduction to Information Theory for Vision

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Bruno Jedynak** (Johns Hopkins University)
Game of Twenty Questions with noisy answers. A paradigm for Human and Computer Vision. Information Theory. Sequential acquisition of information

3:30–4:00 *Break*

4:00–5:00 **Bruno Jedynak** (Johns Hopkins University)
20Q for Fast face detection, micro-surgical tool tracking and electron microscopy

Thursday August 1, 2013

8:00–9:00 *Continental Breakfast*

9:00–10:00 **David Gu** (SUNY Stony Brook)
Tutorial on Conformal Geometry for Computer Vision

10:00–10:30 *Break*

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10:30–11:30 **David Gu** (SUNY Stony Brook)
Tutorial on Surface Ricci Flow for Shape Registration and Analysis

11:30–12:00 *Break*

12:00–1:00 **Ronen Basri** (Weizmann Institute of Science)
Lambertian model of reflectance I: shape from shading and photometric stereo

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Ronen Basri** (Weizmann Institute of Science)
Lambertian model of reflectance II: harmonic analysis

3:30–4:00 *Break*

4:00–5:00 **David Gu** (SUNY Stony Brook)
Tutorial on Optimal Mass Transport Theory for Computer Vision

Friday August 2, 2013

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Raquel Urtasun** (Toyota Technological Institute at Chicago)
Gaussian Processes (I)

10:00–10:30 *Break*

10:30–11:30 **Raquel Urtasun** (Toyota Technological Institute at Chicago)
Gaussian Processes (II)

11:30–12:00 *Break*

12:00–1:00 **Anand Rangarajan** (University of Florida)
New variational approaches in vision

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Alan Yuille** (University of California, Los Angeles (UCLA))
Adaboost and SVM for object detection

3:30–4:00 *Break*

4:00–5:00 **Raquel Urtasun** (Toyota Technological Institute at Chicago)
3D scene understanding with structured models

Monday August 5, 2013

8:00–9:00	*Continental Breakfast*
9:00–10:00	**Yi Ma** (Microsoft Research Asia) *(with John Wright) Sparse and Low-Rank Representation - Lecture I: Motivation and Theory*
10:00–10:30	*Break*
10:30–11:30	**John Wright** (Columbia University) *(with Yi Ma) Lecture II: Data Modeling and Applications*
11:30–12:00	*Break*
12:00–1:00	**Yi Ma** (Microsoft Research Asia) *(with John Wright) Lecture III: Algorithms*
1:00–2:30	*Lunch (on your own)*
2:30–3:30	**Lieven Vandenberghe** (University of California, Los Angeles (UCLA)) *Convex optimization Part 1: analysis, basic problem classes, and applications*
3:30–4:00	*Break*
4:00–5:00	**Lieven Vandenberghe** (University of California, Los Angeles (UCLA)) *Convex Optimization Part 2: first-order algorithms*

Tuesday August 6, 2013

8:00–9:00	*Continental Breakfast*
9:00–10:00	**Anand Rangarajan** (University of Florida) *Shape Matching*
10:00–10:30	*Break*
10:30–11:30	**Iasonas Kokkinos** (École Centrale de Paris) *Statistical Shape Models*
11:30–12:00	*Break*
12:00–1:00	**Fei Sha** (University of Southern California (USC)) *Dimension Reduction (Part 1)*
1:00–2:30	*Lunch (on your own)*
2:30–3:30	**Fei Sha** (University of Southern California (USC)) *Manifold Learning (Part 2)*
3:30–4:00	*Break*

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4:00–5:00 **John Wright** (Columbia University)
(with Yi Ma) Session 4: A Bayesian Viewpoint on Concise Signal Models

Wednesday August 7, 2013

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Deva Ramanan** (University of California, Irvine (UCI))
Pictorial Structures

10:00–10:30 *Break*

10:30–11:30 **Iasonas Kokkinos** (École Centrale de Paris)
Fast Deformable Part Models detection using Branch-and-Bound

11:30–12:00 *Break*

12:00–1:00 **Martial Hebert** (Carnegie-Mellon University)
Object recognition and scene parsing using 3D cues

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Martial Hebert** (Carnegie-Mellon University)
Unsupervised discovery of category and object models

3:30–4:00 *Break*

4:00–5:00 **Deva Ramanan** (University of California, Irvine (UCI))
Latent SVMs

Thursday August 8, 2013

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Deva Ramanan** (University of California, Irvine (UCI))
Temporal models for action recognition (HMMs, semi-markov models, CFGs)

10:00–10:30 *Break*

10:30–11:30 **Martial Hebert** (Carnegie-Mellon University)
Semantic Labeling of Images

11:30–12:00 *Break*

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12:00–1:00 **Alan Yuille** (University of California, Los Angeles (UCLA))
Compositional Models for Vision

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Sinisa Todorovic** (Oregon State University)
Scheduling Cost-Sensitive Inference of AND-OR Graphs for Video Parsing

3:30–4:00 *Break*

4:00–5:00 **Sinisa Todorovic** (Oregon State University)
Human activities as Stochastic Kronecker Graphs

Friday August 9, 2013

8:00–9:00 *Continental Breakfast*

9:00–10:00 **Don Geman** (Johns Hopkins University)
Fine-grained Categorization of Botanical Shapes

10:00–10:30 *Break*

10:30–11:30 **Alan Yuille** (University of California, Los Angeles (UCLA))

11:30–12:00 *Break*

12:00–1:00 **Deva Ramanan** (University of California, Irvine (UCI))
Future Challenges in Object Recognition

1:00–2:30 *Lunch (on your own)*

2:30–3:30 **Fei Fei Li** (Stanford University)
Datasets and Challenges

3:30–4:00 *Break*

4:00–5:00 **Don Geman** (Johns Hopkins University)
A Restricted Turing Test for Computer Vision Systems