<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments</th>
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<tbody>
<tr>
<td>1</td>
<td>Sept 29</td>
<td>Introduction; Instance-level recognition I. - Camera geometry (J. Ponce)</td>
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<td>2</td>
<td>Oct 6</td>
<td>Instance-level recognition II. - Local invariant features (C. Schmid)</td>
<td>Assignment 1 out</td>
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<td>Instance-level recognition III. – Correspondence, efficient visual search (C. Schmid)</td>
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<td>3</td>
<td>Oct 13</td>
<td>Sparse coding and dictionary learning for image analysis (J. Ponce)</td>
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<td>4</td>
<td>Oct 20</td>
<td>Instance-level recognition IV. - Very large scale image indexing (C. Schmid)</td>
<td>Assignment 1 due, Assignment 2 out</td>
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<td>Bag-of-feature models for category-level recognition (C. Schmid)</td>
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<td>5</td>
<td>Oct 27</td>
<td>Neural networks; Optimization methods (N. Le Roux)</td>
<td>Assignment 1 due, Final project proposal due (Nov 21)</td>
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<tr>
<td>6</td>
<td>Nov 3</td>
<td>Convolutional neural networks for visual recognition (J. Sivic)</td>
<td>Assignment 2 due, Assignment 3 out</td>
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<td>7</td>
<td>Nov 10</td>
<td>Structured models for category-level localization and pose estimation (I. Laptev and J. Sivic)</td>
<td>Assignment 3 due</td>
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<td>8</td>
<td>Nov 17</td>
<td>Motion and human actions I. (I. Laptev)</td>
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<td>9</td>
<td>Nov 24</td>
<td>Motion and human actions II. (C. Schmid)</td>
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<td>Weakly-supervised learning (C. Schmid)</td>
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<td>10</td>
<td>Dec 1</td>
<td>Scenes, Objects and 3D reasoning (I. Laptev)</td>
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<td>11</td>
<td>Jan 7</td>
<td>Final project presentations and evaluation (All students)</td>
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<tr>
<td>12</td>
<td>Jan 8</td>
<td>Final project presentations and evaluation (All students)</td>
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Object recognition and computer vision 2015

Class webpage:
http://www.di.ens.fr/willow/teaching/recvis15

Grading:

- 3 programming assignments (50%)
  - Instance-level recognition
  - Image classification
  - Convolutional Neural Networks

- Final project (50%)

More independent work, resulting in a report and a class presentation.

Policy

Assignments are strictly individual

Copy-paste of the code, results, parts of the report \(\rightarrow 0p.\)

FPs can be done in groups of max 2 people
Assignment I: Instance level recognition

- Part I: Sparse features for matching specific objects in images
- Part II: Affine co-variant detectors
- Part III: Towards large scale retrieval
- Part IV: Large scale retrieval
Assignment II: Image Classification

- Part 1: Training and testing an Image Classifier
- Part 2: Training an Image Classifier for Retrieval using Google images
Assignment III: Image Classification with Convolutional Neural Networks

- Part 1: Neural Network’s theory:
  - Forward pass
  - Backward pass
  - Parameter update

- Part 2: PASCAL VOC Image classification with ConvNet features
Final project

- Select the topic + write project proposal
- Present the work in the class
- Write project report

- Can be done individually or as a group of max 2 people
- The proposed project topics are from the recent top-conference publications in computer vision, see example topics from 2014 here: http://www.di.ens.fr/willow/teaching/recvis14/
- Student-defined projects are welcome
- Final project can be joint with another MVA course
Matlab tutorial

Possible dates

- Oct 5 (Monday) 10:00-12:00 or 14:00-16:00
- Oct 6 (Tuesday) 10:00-12:00
- Oct 8 (Thursday) 10:00-12:00 or 14:00-16:00
- Oct 9 (Friday) 10:00-12:00 or 14:00-16:00

The tutorial will be at INRIA/Willow, 23 av. d'Italie, Paris

Who should participate?
- Students with no or limited experience with Matlab.
Research

Both WILLOW (J. Ponce, I. Laptev, J. Sivic) and LEAR (C. Schmid) groups are active in computer vision and visual recognition research.

http://www.di.ens.fr/willow/
http://lear.inrialpes.fr/

with close links to SIERRA – machine learning (F. Bach)
http://www.di.ens.fr/sierra/

There will be master internships available. Talk to us if you are interested!