



POLITECNICO DI MILANO  
DEPARTMENT OF ELECTRONICS, INFORMATION AND  
BIOENGINEERING  
DOCTORAL PROGRAMME IN COMPUTER SCIENCE

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# DEEP LEARNING FOR VISUAL STRUCTURED PREDICTION

Doctoral Dissertation of:  
**Francesco Visin**

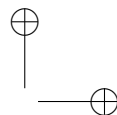
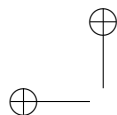
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Co-Supervisor:  
**Prof. Aaron Courville**

Tutor:  
**Prof. Andrea Bonarini**

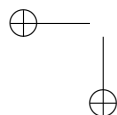
The Chair of the Doctoral Program:  
**Prof. Coordinator Name**

2016 – XXVIII

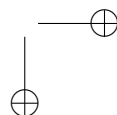


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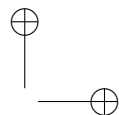
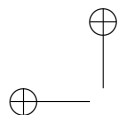
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## Abstract

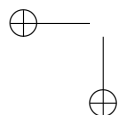
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**A**BSTRACT goes here.

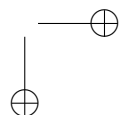


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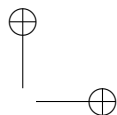
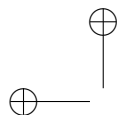
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## Summary

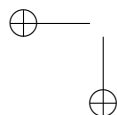
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SUMMARY goes here.

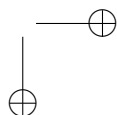


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# CHAPTER *1*

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## Introduction

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### 1.1 Introduction

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Remember that wherever you want you can cite with `\cite{a1}` [1], [2] and/or [3] someone. Or use `\footnote{That's a footnote}` like this<sup>1</sup>

### 1.2 New section

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You can insert a definition

**Definition 1.2.1.** *PoliMi: Politecnico di Milano*

### 1.3 Another section

---

#### 1.3.1 And a subsection

In this sub section I will include many images just to make the list of figures meaningful.

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<sup>1</sup>That's a footnote

## Chapter 1. Introduction

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**Figure 1.1:** *Caption of this PoliMi image.*

### 1.4 New section

---

#### 1.4.1 And also many sub

Or again more nested

- item 1
- item 2
- item 3

### 1.5 New section

---

This is an example of table. You can see it in Table 1.1.

**Table 1.1:** *Table caption*

Col 1 Dim C.1	Col 2 Dim C.3	Col2 Dim C.3
Data 1.1	Data 1.2	Data 1.3
Data 2.1	Data 2.2	Data 2.3
Data 3.1	Data 3.2	Data 3.3

### 1.6 You can do as many section as you want

---

The following equation has been created using  $\$$ :  $y_1 = a * x + b$ .

This is a more complex equation:

$$y_2 = a * x + b$$

, created using  $\backslash [ \ \backslash ]$

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## 1.6. You can do as many section as you want

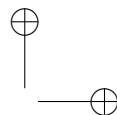
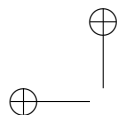
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This is, (1.1), an enumerated equation:

$$y_3 = a * x + b \tag{1.1}$$

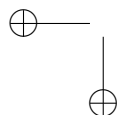
, created using:

```
\begin{equation}\label{eq:eeq1}  
  y_3 = a*x + b  
\end{equation}
```

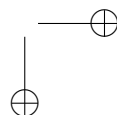


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## CHAPTER 2

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# Convolutional networks

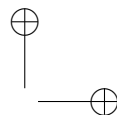
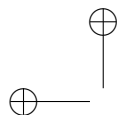
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### 2.1 Introduction

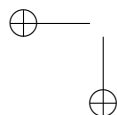
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Write something about convolutions, transposed convolutions, deconvolutions, ..

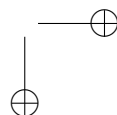


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## CHAPTER 3

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### Recurrent networks

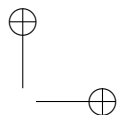
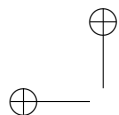
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#### 3.1 Introduction

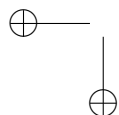
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Write something about RNNs, LSTMs, GRUs

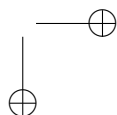


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## CHAPTER 4

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### State of the art

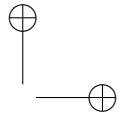
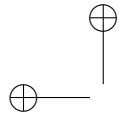
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#### 4.1 Introduction

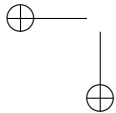
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Write something about SOTA in classification, detection, semantic segmentation, video segmentation

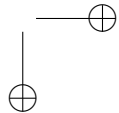


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# CHAPTER 5

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## ReNet

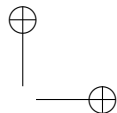
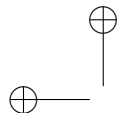
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### 5.1 Introduction

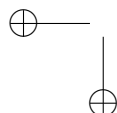
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Write something about ReNet

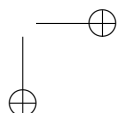


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# CHAPTER 6

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## ReSeg

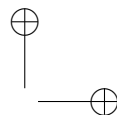
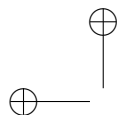
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### 6.1 Introduction

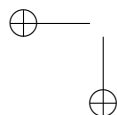
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Write something about ReSeg

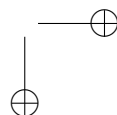


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# CHAPTER 7

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## DeconvRNN

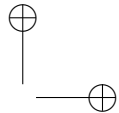
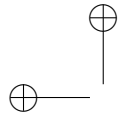
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### 7.1 Introduction

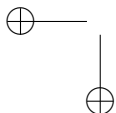
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Write something about video segmentation

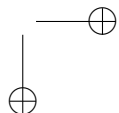


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## Bibliography

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- [1] Author1, Author2. Title article 1. *Journal*, 1(1):1–10, 1000.
- [2] Author1, Author2. *Title Book 1*. Publisher, 1000.
- [3] Author1, Author2. *Title Manual 1*. Organization, e.g University, 1000. available online at <http://www.microlab-mi.net>.