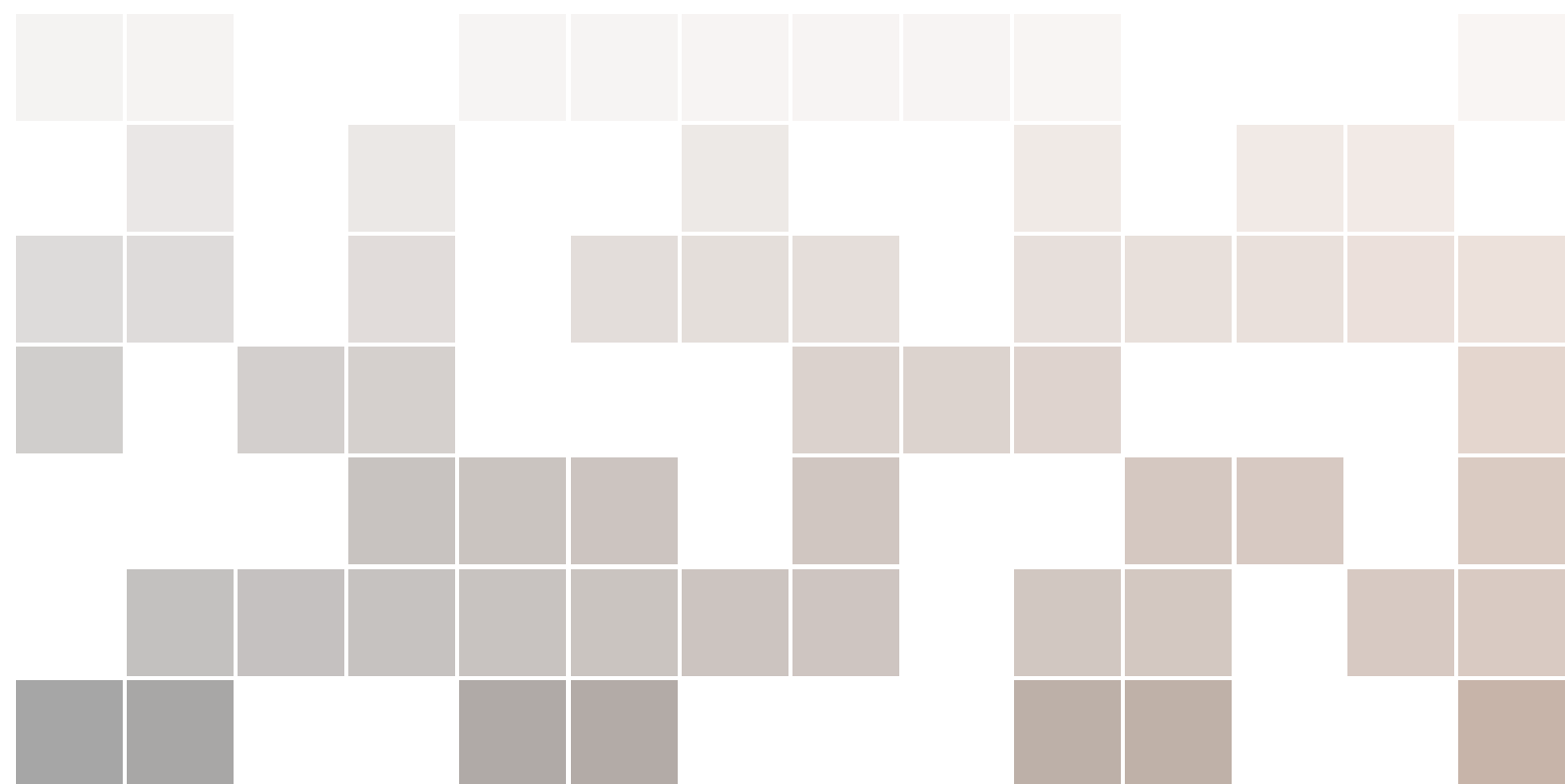


# Representation and Reasoning for Intelligent Systems

Stefan Klaus



Copyright © 2013 John Smith

NOT PUBLISHED

GITHUB.COM/DARKLORDNORGE

Licensed under the Creative Commons Attribution-NonCommercial 3.0 Unported License (the “License”). You may not use this file except in compliance with the License. You may obtain a copy of the License at <http://creativecommons.org/licenses/by-nc/3.0>. Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an “AS IS” BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

*First printing, March 2013*

# Contents

<b>1</b>	<b>Constraint Satisfaction Problem</b>	<b>5</b>
1.1	Citation	5
1.2	Lists	5
1.2.1	Numbered List	5
1.2.2	Bullet Points	5
1.2.3	Descriptions and Definitions	5
<b>2</b>	<b>In-text Elements</b>	<b>7</b>
2.1	Theorems	7
2.1.1	Several equations	7
2.1.2	Single Line	7
2.2	Definitions	7
2.3	Notations	8
2.4	Remarks	8
2.5	Corollaries	8
2.6	Propositions	8
2.6.1	Several equations	8
2.6.2	Single Line	8
2.7	Examples	8
2.7.1	Equation and Text	8
2.7.2	Paragraph of Text	9
2.8	Exercises	9
2.9	Problems	9
2.10	Vocabulary	9

<b>3</b>	<b>Presenting Information</b> .....	<b>11</b>
<b>3.1</b>	<b>Table</b>	<b>11</b>
<b>3.2</b>	<b>Figure</b>	<b>11</b>
	<b>Bibliography</b> .....	<b>13</b>
	<b>Books</b>	<b>13</b>
	<b>Articles</b>	<b>13</b>
	<b>Index</b> .....	<b>15</b>

# 1. Constraint Satisfaction Problem

## 1.1 Citation

This statement requires citation [Smi12]; this one is more specific [Smi13, page 122].

## 1.2 Lists

Lists are useful to present information in a concise and/or ordered way<sup>1</sup>.

### 1.2.1 Numbered List

1. The first item
2. The second item
3. The third item

### 1.2.2 Bullet Points

- The first item
- The second item
- The third item

### 1.2.3 Descriptions and Definitions

**Name** Description

**Word** Definition

**Comment** Elaboration

---

<sup>1</sup>Footnote example...



## Theorems

Several equations  
Single Line

## Definitions

## Notations

## Remarks

## Corollaries

## Propositions

Several equations  
Single Line

## Examples

Equation and Text  
Paragraph of Text

## Exercises

## Problems

## Vocabulary

## 2. In-text Elements

### 2.1 Theorems

This is an example of theorems.

#### 2.1.1 Several equations

This is a theorem consisting of several equations.

**Theorem 2.1.1 — Name of the theorem.** In  $E = \mathbb{R}^n$  all norms are equivalent. It has the properties:

$$||\mathbf{x}|| - ||\mathbf{y}|| \leq ||\mathbf{x} - \mathbf{y}|| \quad (2.1)$$

$$||\sum_{i=1}^n \mathbf{x}_i|| \leq \sum_{i=1}^n ||\mathbf{x}_i|| \quad \text{where } n \text{ is a finite integer} \quad (2.2)$$

#### 2.1.2 Single Line

This is a theorem consisting of just one line.

**Theorem 2.1.2** A set  $\mathcal{D}(G)$  is dense in  $L^2(G)$ ,  $|\cdot|_0$ .

### 2.2 Definitions

This is an example of a definition. A definition could be mathematical or it could define a concept.

**Definition 2.2.1 — Definition name.** Given a vector space  $E$ , a norm on  $E$  is an application, denoted  $||\cdot||$ ,  $E$  in  $\mathbb{R}^+ = [0, +\infty[$  such that:

$$||\mathbf{x}|| = 0 \Rightarrow \mathbf{x} = \mathbf{0} \quad (2.3)$$

$$||\lambda \mathbf{x}|| = |\lambda| \cdot ||\mathbf{x}|| \quad (2.4)$$

$$||\mathbf{x} + \mathbf{y}|| \leq ||\mathbf{x}|| + ||\mathbf{y}|| \quad (2.5)$$

## 2.3 Notations

**Notation 2.1.** Given an open subset  $G$  of  $\mathbb{R}^n$ , the set of functions  $\varphi$  are:

1. Bounded support  $G$ ;
2. Infinitely differentiable;

a vector space is denoted by  $\mathcal{D}(G)$ .

## 2.4 Remarks

This is an example of a remark.

**R** The concepts presented here are now in conventional employment in mathematics. Vector spaces are taken over the field  $\mathbb{K} = \mathbb{R}$ , however, established properties are easily extended to  $\mathbb{K} = \mathbb{C}$ .

## 2.5 Corollaries

This is an example of a corollary.

**Corollary 2.5.1 — Corollary name.** The concepts presented here are now in conventional employment in mathematics. Vector spaces are taken over the field  $\mathbb{K} = \mathbb{R}$ , however, established properties are easily extended to  $\mathbb{K} = \mathbb{C}$ .

## 2.6 Propositions

This is an example of propositions.

### 2.6.1 Several equations

**Proposition 2.6.1 — Proposition name.** It has the properties:

$$||\mathbf{x}| - |\mathbf{y}|| \leq |\mathbf{x} - \mathbf{y}| \quad (2.6)$$

$$||\sum_{i=1}^n \mathbf{x}_i|| \leq \sum_{i=1}^n ||\mathbf{x}_i|| \quad \text{where } n \text{ is a finite integer} \quad (2.7)$$

### 2.6.2 Single Line

**Proposition 2.6.2** Let  $f, g \in L^2(G)$ ; if  $\forall \varphi \in \mathcal{D}(G)$ ,  $(f, \varphi)_0 = (g, \varphi)_0$  then  $f = g$ .

## 2.7 Examples

This is an example of examples.

### 2.7.1 Equation and Text

■ **Example 2.1** Let  $G = \{x \in \mathbb{R}^2 : |x| < 3\}$  and denoted by:  $x^0 = (1, 1)$ ; consider the function:

$$f(x) = \begin{cases} e^{|x|} & \text{si } |x - x^0| \leq 1/2 \\ 0 & \text{si } |x - x^0| > 1/2 \end{cases} \quad (2.8)$$

The function  $f$  has bounded support, we can take  $A = \{x \in \mathbb{R}^2 : |x - x^0| \leq 1/2 + \varepsilon\}$  for all  $\varepsilon \in ]0; 5/2 - \sqrt{2}[$ . ■



### 2.7.2 Paragraph of Text

■ **Example 2.2 — Example name.** Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

■

## 2.8 Exercises

This is an example of an exercise.

**Exercise 2.1** This is a good place to ask a question to test learning progress or further cement ideas into students' minds.

■

## 2.9 Problems

**Problem 2.1** What is the average airspeed velocity of an unladen swallow?

## 2.10 Vocabulary

Define a word to improve a students' vocabulary.

**Vocabulary 2.1 — Word.** Definition of word.



### 3. Presenting Information

#### 3.1 Table

Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Table 3.1: Table caption

#### 3.2 Figure

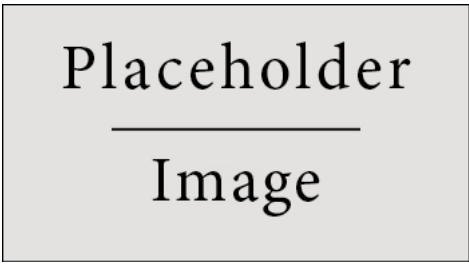


Figure 3.1: Figure caption





## Bibliography

### Books

[Smi12] John Smith. *Book title*. 1st edition. Volume 3. 2. City: Publisher, Jan. 2012, pages 123–200 (cited on page 5).

### Articles

[Smi13] James Smith. “Article title”. In: 14.6 (Mar. 2013), pages 1–8 (cited on page 5).



# Index

## C

Citation .....	6
Corollaries .....	8

## D

Definitions .....	7
-------------------	---

## E

Examples .....	8
Equation and Text .....	8
Paragraph of Text .....	9
Exercises .....	9

## F

Figure .....	11
--------------	----

## L

Lists .....	6
Bullet Points .....	6
Descriptions and Definitions .....	6
Numbered List .....	6

## N

Notations .....	8
-----------------	---

## P

Paragraphs of Text .....	5
Problems .....	9
Propositions .....	8
Several Equations .....	8
Single Line .....	8

## R

Remarks .....	8
---------------	---

## T

Table .....	11
Theorems .....	7
Several Equations .....	7
Single Line .....	7

## V

Vocabulary .....	9
------------------	---