

# Digital Twin for Industrial Edge 4.0: Concepts and Tools

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## **Abstract**

*This LaTeX template is used for typesetting the seminar papers for the Seminar in Computer Science.*

*KEYWORDS: keywords, separated by commas*

## **1 Introduction**

To be added.

## **2 Simple things first**

In this section, we give some simple examples of Latex mark-up. Sec. 2.1 emphasizes important points and Sec. 2.2 gives examples of math formulas. Finally, 2.3 demonstrates lists.

### **2.1 Emphasizing text**

*Italics* is a good way to emphasize printed text. However, **boldface** looks better when converted to HTML.

Paragraphs are separated by an empty line in the Latex source code. Latex puts extra space between sentences, which you must suppress after a period that does not end a sentence, e.g. after this acronym.

Cross-references to figures (Fig. 1), tables (Table 1), other sections (Sec. 2.2) are easy to create.

## 2.2 Mathematics

In the mathematics mode, you can have subscripts such as  $K_{master}$  and superscripts like  $2^x$ . Longer formulas may be put on a separate line:

$$\emptyset \in \emptyset \Rightarrow E \neq mc^2.$$

You may also want to number the formulas like Eq. (1) below.

$$C = E_{K_{public}}(P) = P^e. \quad P = D_{K_{private}}(C) = C^d. \quad (1)$$

## 2.3 Make a list

Lists can have either bullets or numbers on them.

- one item
- another item, which is an exceptionally long one for an item and consequently continues on the next line.

Lists can have several levels. Item 1 below contains another list.

1. the fist item

(a) the first subitem

(b) the second subitem

2. the second item

## 3 More complex stuff

This section provides examples of more complex things.

Protocol	Year	RFC
TCP	1981	793
ISAKMP	1998	2408
Photuris	1999	2522

**Table 1.** A table with some protocols

### 3.1 Data served on a table

Table 1 presents some data in tabular form.

### 3.2 Adding references

Do not forget to give pointers to the literature. If you are listing stuff related to your topic, you can give several references once [1, 5, 3]. However, usually you should give only one, for example the standard describing the stuff [2] and if you want to directly use someone else’s words, use both quotation marks and refer to the source, for example that “the developer does not need to know all about the framework to develop a working implementation” [4]. Remember also to mark references to your pictures if they are not created by your own mind!

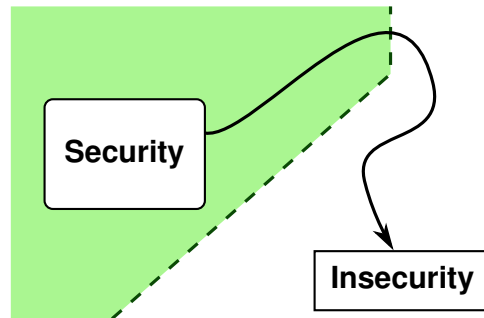
If you plan to write with Latex regularly, create your own BibTeX database and use BibTeX to typeset the bibliographies automatically. In the long run, it will save you a lot of time and effort compared to compiling reference lists by hand.

### 3.3 Embedded pictures

Fig. 1 is an embedded picture. The supported formats for pictures depend on the actual LaTeX command used. For instance, regular LaTeX supports pictures in EPS (Embedded PostScript) format, while pdfLaTeX supports PDF (Portable Document Format), PNG (Portable Network Graphics) and JPEG (Joint Photographic Experts Group). It is recommended to use either EPS or PDF for diagrams as well as for any picture which includes vector images.

## 4 Yet another section title

To be added.



**Figure 1.** An embedded picture

## 5 Conclusion

To be added.

## References

- [1] Douglas E. Comer. *Internetworking with TCP/IP, Volume I*. Prentice-Hall Inc, 4th edition, 2000.
- [2] D. Maughan, M. Schertler, M. Schneider, and J. Turner. Internet Security Association and Key Management Protocol (ISAKMP). RFC 2408, The Internet Engineering Task Force, November 1998. <http://ietf.org/rfc/rfc2408.txt>.
- [3] Pekka Nikander. *An Architecture for Authorization and Delegation in Distributed Object-Oriented Agent Systems*. PhD thesis, Helsinki University of Technology, March 1999.
- [4] Sanna Suoranta. *An Object-Oriented Implementation of an Authentication Protocol*. Master's thesis, Helsinki University of Technology, November 1998.
- [5] Tim Hsin-ting Hu and Binh Thai and Aruna Seneviratne. Supporting Mobile Devices in Gnutella File Sharing Network with Mobile Agents. In *IEEE International Symposium on Computers and Communication*, volume 3, pages 1530–1546, April 2003.