University of Applied Sciences

HOCHSCHULE
EMDEN·LEER

Scientific Project - Best Practice

Prof. Dr. E. Wings

Agenda

1. General
2. Building the Infrastructure
3. Literature research
4. Creation of an outline
5. Preparation of the Project Plan
6. Preparation of documentation
7. Formalities & General Hints
8. How to Start

General

General

The main purposes of publications (reports and presentations) are to disseminate information and to demonstrate the author's personal skills. The role of structure and format is often **underestimated**.

General

Presentations, lectures, reports and documentations are frequently used methods to make information, ideas, results that some people have available to others.

The **success** of information transfer depends not only on the **content** itself, but also to a not inconsiderable extent on the **form** of transfer.

General

However, it should not be forgotten that **the** structure or the way of lecturing does not exist; what is perceived as good or right differs from subject area to subject area, from university to university, even from person to person. The following lines are therefore only intended as food for thought in the structure of such documents or lectures and generally apply equally to both.

General – Goals

Reports and presentations usually aim to achieve three main objectives:

1. Presentation/explanation of a specific issue/topic/problem
2. Engaging/interesting/fascinating listeners/readers
3. "Selling" one's own person/performance

If even one of these aspects is ignored, the impact of the work is rapidly reduced!

Keep in Mind - 10 Things that require Zero Talent

1. Being on Time
2. Making an Effort
3. Being High Energy
4. Having a Posditive Attitude
5. Being Passionate
6. Using Good Body Language
7. Being Coachable
8. Doing a Little Extra
9. Being Prepared
10. Having a String Work Ethic

Building the Infrastructure

Start - Building the Infrastructure

- First create a directory for the project.
- Create a folder for project management.
- Copy the LaTeX template to.
- Name the files for the template correctly:
  - Example „Eckenverrundung“
  - bad „report“
    - In general, do not use spaces or special characters in directory and file names.
    - Use short descriptive terms.
- Create the following files:
  - **author.xlsx**: Project name, authors, matriculation numbers, date, subject, CPs
  - **README.md**: Project name, list of all directories and files, explanation of contents

author.xlsx und README.md

author.xlsx

Name of the project/lecture:
<Mathematik I>
Project's Name:
<Installation and Use of CUDA with Tensorflow>
Supervisor: Prof. Dr. Elmar Wings
CPs: <5>

Author:
Name, first name, matriculation number
<Janssen, Wiebke, 1234567>
Study programme:
<Maschinenbau und Design im Praxisverbund>
Semester: 4

Name, first name, matriculation number
<Janßen, Peter, 7654321>
Study programme:
<IBS>
Semester: 4

Name, first name, matriculation number
...

README.md

Name of the project/lecture:
<Mathematik I>
Project's Name:
<Installation and Use of CUDA with Tensorflow>
Supervisor: Prof. Dr. Elmar Wings
<Brief description>
1. Name, first name, matriculation number
2. Name, first name, matriculation number
...
(Documents for the term paper)
Folder structure CUDAWithTensorFlow:
Report (elaboration in LaTeX)
Literature (Literature/documents used as pdf files)
README.md
author.xlsx
Folder structure report:
CUDAWithTensorflow.tex
CUDAWithTensorflow.pdf
General
Bib
Images
Chapters
...

Github.com

- Create accounts at GitHub.com
- Create a project at GitHub.com
- Copy the project directory into the GitHub project
- Test access
- Check whether a **README.md** file exists.

Installing the software

- Installing LaTeX: TeXLive
- Installation takes time! Before you carry out further installations, the installation must be completed.
- Wait!
- Installing TeXstudio
- Installing Sumatra PDF
- In a programming task:
  Installing doxygen

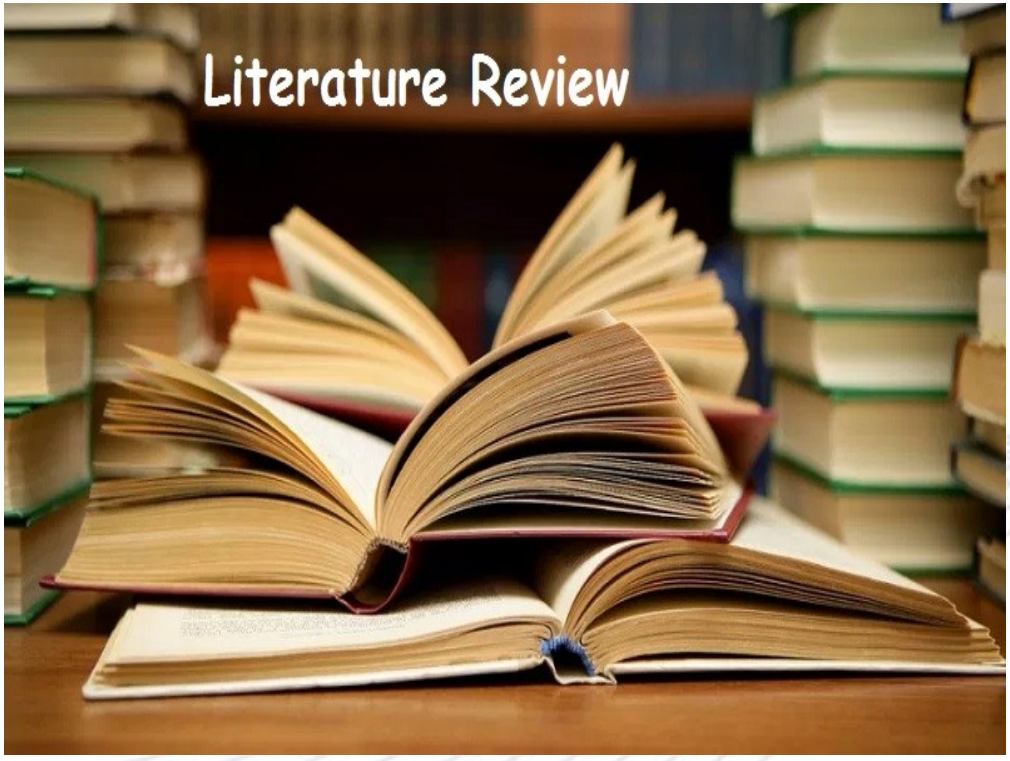
Software test

- Test LaTeX by using the template. However, the template must **not** be changed.
- Configure TeXstudio
  - Options → Configuration . . . → create → Standard bibliography program: biber.exe
  - Options → Configuration . . . → commands → External pdf viewer: sumatrapdf.exe

First Steps with LaTeX

- read the template (pdf/tex)
- Keep commands, replace contents, e.g.
  - Headlines
  - Tables
  - Graphics
  - Enumerations
  - ...

Literature research



Literature research

A list of sources/Literature is necessary in any case; it has several aims. On the one hand, it should show that the author has made extensive enquiries in many competent places. On the other hand, it shows that he has naturally drawn on existing knowledge (and not invented the wheel for the third time . . .), but that he also names others as authors out of respect for their achievements (this also applies to pictures taken from others!). Finally, the directory is the starting point for those interested to delve deeper into the matter.

Literature research

- Article from a specific journal
- conference article
- Technical book
- phd-Thesis
- Website
  - Data sheets
  - Only source
  - Wikipedia
  - slideshare, lectures

Literature research

- Search for literature e.g. at
  - https://link.springer.com
  - https://ieeexplore.ieee.org
  - https://www.scopus.com/
  - https://www.sciencedirect.com/
  - https://scholar.google.de
  - https://www.researchgate.net
  - https://www.zenodo.org
  - https://depatisnet.dpma.de/DepatisNet/depatisnet?action=einsteiger
  - https://worldwide.espacenet.com/
  - Library of the university: Media offers or shibboleth
  - **Attention!** https://www.bing.com/ – copilot

It is recommended to use Citavi or jabref.

Literature research - Datasets

- https://datasetsearch.research.google.com/search
- https://www.kaggle.com/datasets
- https://www.data.gov/
- https://www.govdata.de/
- https://datahub.io/collections
- https://archive.ics.uci.edu/ml/datasets.php
- https://earthdata.nasa.gov/
- https://apps.who.int/gho/data/node.home
- https://www.bfi.org.uk/education-research/film-industry-statistics-research
- https://www1.nyc.gov/site/tlc/about/tlc-trip-record-data.page
- https://github.com/awesomedata/awesome-public-datasets
- https://data.world/datasets/open-data
- https://azure.microsoft.com/de-de/products/open-datasets

Literature research

Results:

- List of keywords
- Brief description of the sources:
  - Why was this source chosen?
  - What is covered?
  - What is good/bad?
- bib file
- Bibliography

Literature research

When do you have enough literature sources:

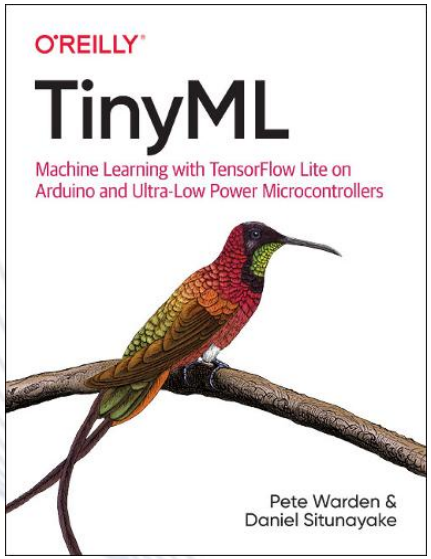
- Have you covered all the keywords?
- Have you reached the minimum number?
- Have you reached the maximum number?

bib Entries

- use the correct bib type, e.g. article, book, proeceedings, inproceedings, online
- minimal information
  - author/editor
  - title
  - year
  - publisher
- if you find a bib entry, please check it.

Literature - Example

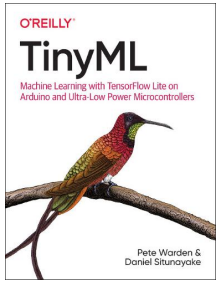
Pete Warden and Daniel Situnayake, *TinyML – Machine Learning with TensorFlow on Arduino, and Ultra-Low Power Micro-Controllers*, O'Reilly Media, 2019, isbn: 9781492052043



A detailed and good introduction to TinyML for the edge computers Arduino Nano 33 BLE Sense, SparkFun Edge 165m and ST Microelectronics STM32F746G Discovery Kit. The book includes step-by-step instructions with source code. It is not an introduction to machine learning.

Keywords: TinyML, Edge Computer, Arduino Nano 33 BLE Sense, TensorFlow, TensorFlow Lite, TensorFlow Micro

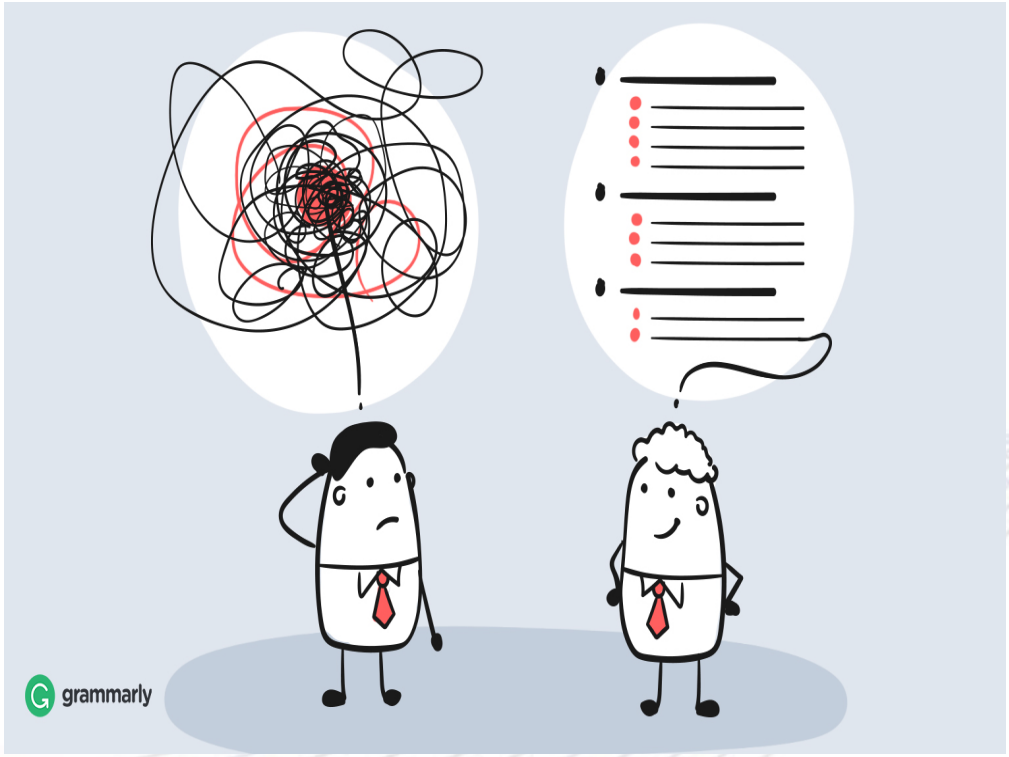
Literature - Example



Pete Warden and Daniel Situnayake, *TinyML – Machine Learning with TensorFlow on Arduino, and Ultra-Low Power Micro-Controllers*, O'Reilly Media, 2019, isbn: 9781492052043

```
@Book={Warden:2019,
    publisher   =   {O'Reilly Media},
    author      =   {Warden, Pete and Situnayake, Daniel},
    year        =   2019,
    title       =   {TinyML - Machine Learning with TensorFlow
                    Lite on Arduino and Ultra-Low-Power
                    Microcontrollers},
    keywords    =   {Machine Learning, Microcontrollers, Arduino},
    isbn        =   {9781492052043},
}
```

Creation of an outline



Creation of an outline

Based on the keywords and the research, an outline can now be created.

Writing the introduction

The following facts are presented in the introduction:

- Embedding of the project/state of the art with sources
- Description of the task
- Description of the particular challenges with sources
- Description of how the challenges were solved.
- Brief description of the procedure and contents of the individual chapters.

Attention: This will not be a 100% solution. The introduction must be revised several times.

Writing the introduction - Example

„This paper is an examination performance of the module XY of the Department of Mechanical Engineering at Emden/Leer University of Applied Sciences. On the basis of this paper, a group assessment is awarded and the module is deemed to have been passed. The grade is included in the overall grade point average.“

„The aim of this paper is to show the reader how . . . works and how it can be applied to the problem XY. If this is achieved, a good grade should come out.“

Writing the introduction - Example

„Flettner rotors are now widely used [1,2,3]. . . .“

„The construction of a Flettner rotor for a water taxi [4] . . . “

„External influences pose great challenges to [5,6] . . . “

„Through the use of 3D printed parts, . . . “

„In the second chapter, . . . “

Preparation of the Project Plan

Preparation of the Project Plan

Now the project plan must be created:

- Which subtasks exist?
- What results do we get at the end of a subtask?
- Which internal dependencies must be taken into account?
- Who is responsible for the subtask?
- Which external dependencies, e.g. orders, delivery times, holidays, must be taken into account?
- How much time does a subtask ideally take?
- How is the required time distributed on the timeline?

Attention: The result is a schedule that must be updated weekly!

Subtasks and their results - Examples

Literature

- Pdf documents
- List of keywords
- Brief description
- bib file
- Bibliography
- Quality check
- ...

Design

- Manual
- Functional description
- Manufacturing instructions
- Assembly instructions
- List of parts
- design drawings
- exploded-view drawing
- Test specification
- ...

Subtasks and their results - Examples

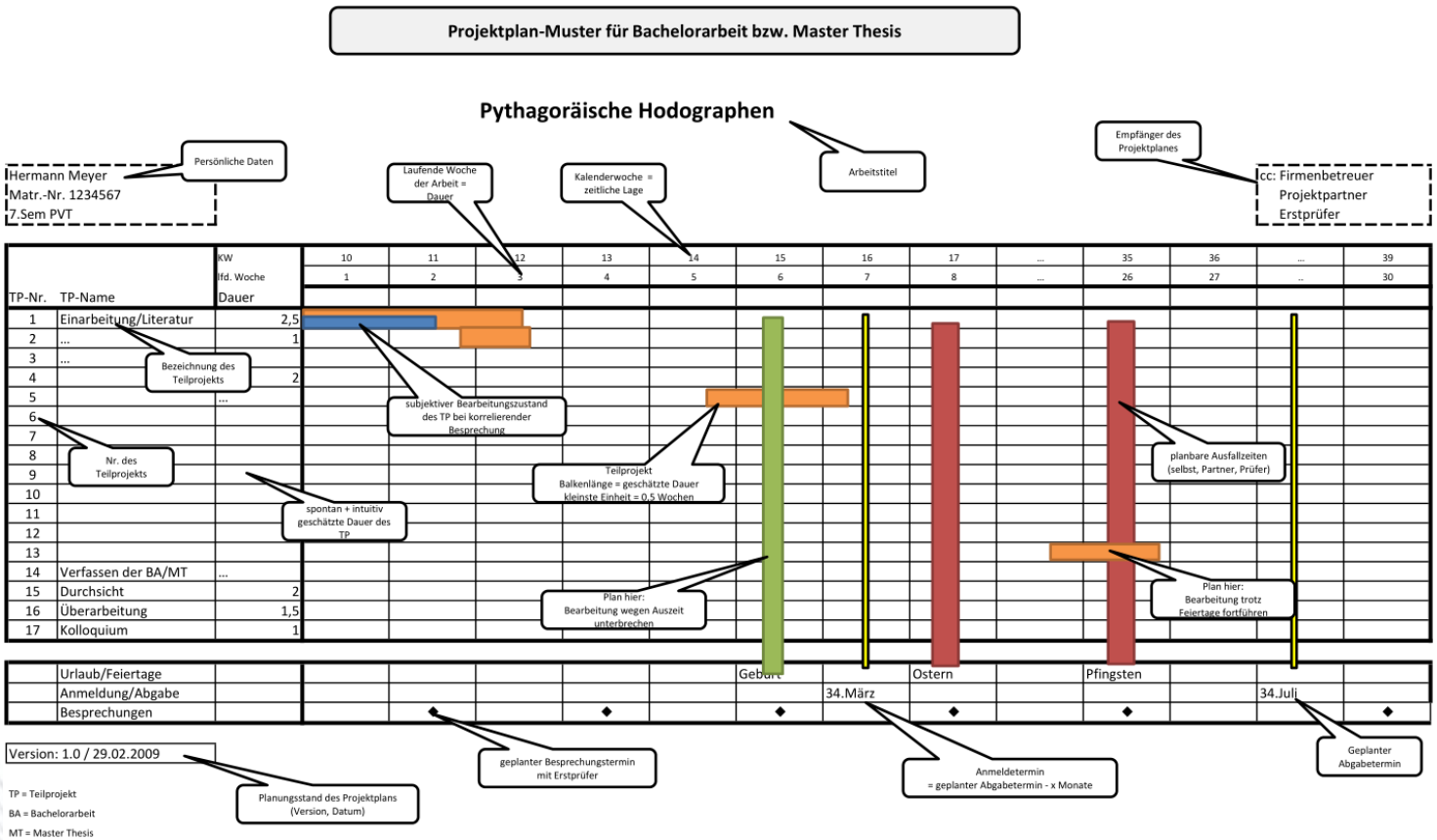
Software

- Manual
- Functional description
- Flow chart
- Test specification
- Code
- ...

Brief description

- LaTeX project
- Brief description
- Quality check
- Appointment for lamination
- Laminated description
- ...

Preparation of the project plan

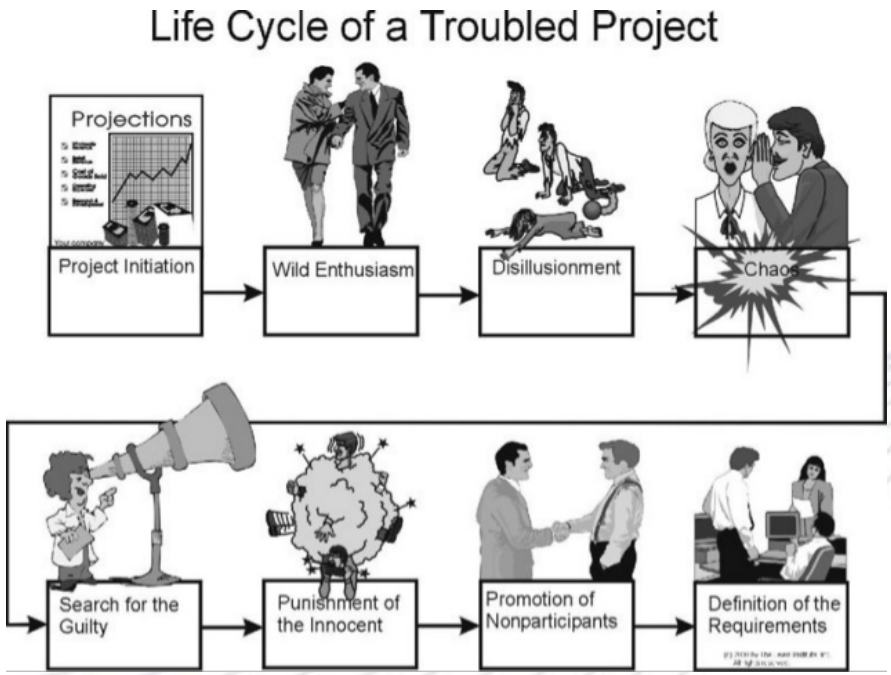


Reminder: 1 CP corresponds to an effort of 30h for an average student and an average grade.

Preparation of the project plan - Questions

The preparation of the schedule should take place in the first week.

⇒ Queries are then easily possible and expected.

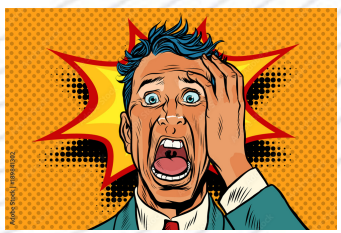


Source funny-blogger

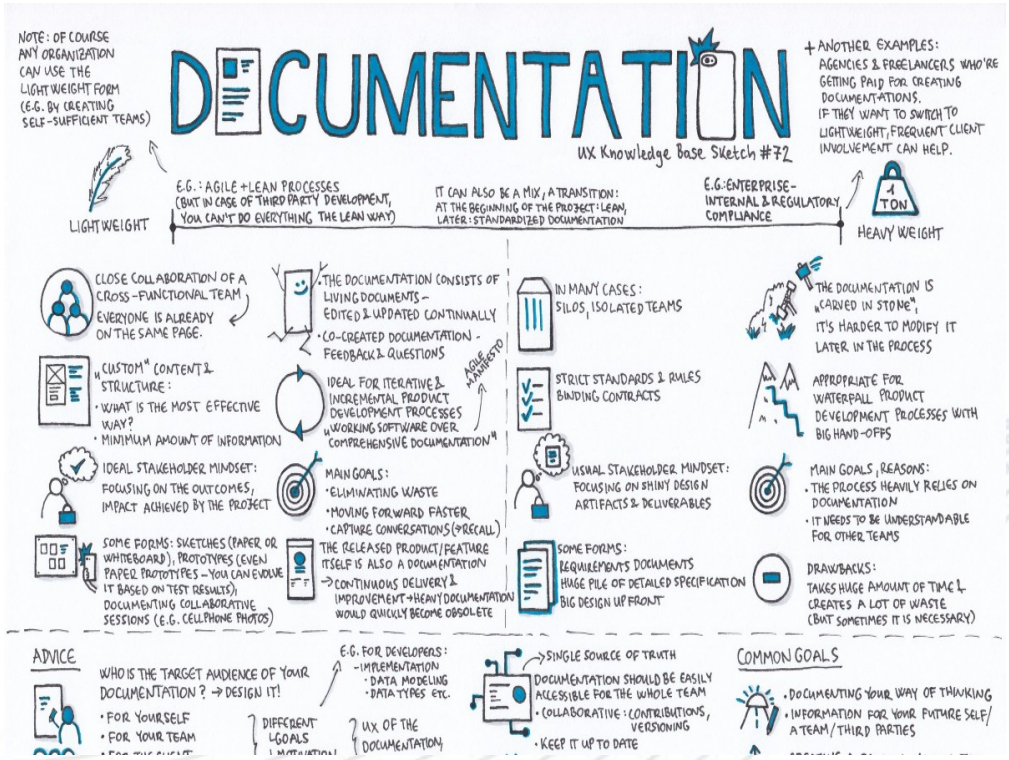
Queries

- 2nd Phase - Wild Enthusiasm:
  → Great!

- End phase:
  → To put it cautiously: Uncertainty of the customer



Preparation of documentation



Preparation of documentation

The documentation must mention who is the author and who edited!

Use the team for quality control!

Use of Images

Illustrations, tables, figures, etc. (“Images”) make the report more lively!

At the latest on every third page, such things should be built into the text.

Use of Images

All pictures should be numbered (consecutively or section by section) and provided with a concise signature. For each of these pictures, the number of the picture ("Picture 6 shows . . . " must be mentioned in the body text and a brief explanation of what it shows must be given; in addition, the important statements of the picture in particular must be verbally formulated.

Use of Images

If images have been taken from external sources, a reference to the source must be placed directly in the image or the respective caption. (In the case of post-processed or altered images, add "according to": according to [4]).

Use of Images

Each image must be complete and self-explanatory; i.e. its data as well as its essential message must be recognisable even if the associated text is cut away!

Use of Images

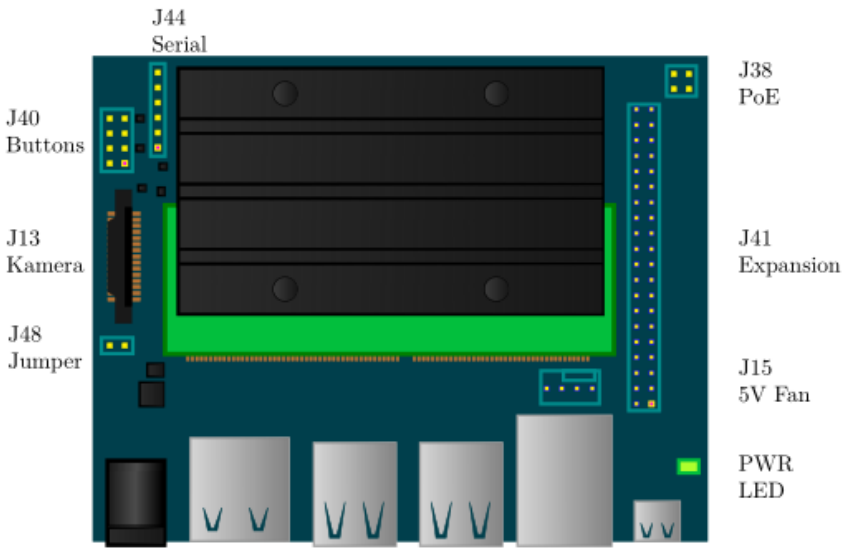
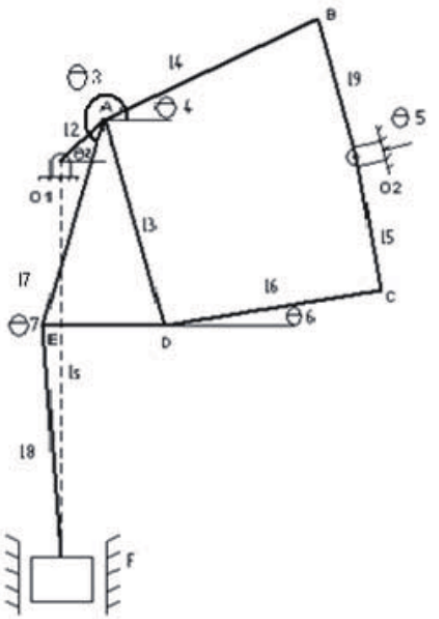


Abbildung 9.4.: Jetson Nano: Aufsicht

Source: author



Source: Balasubramanyam, C. et.al.: Currve fitting for coarse data using Artificial Neural Network [8]

Use of Images

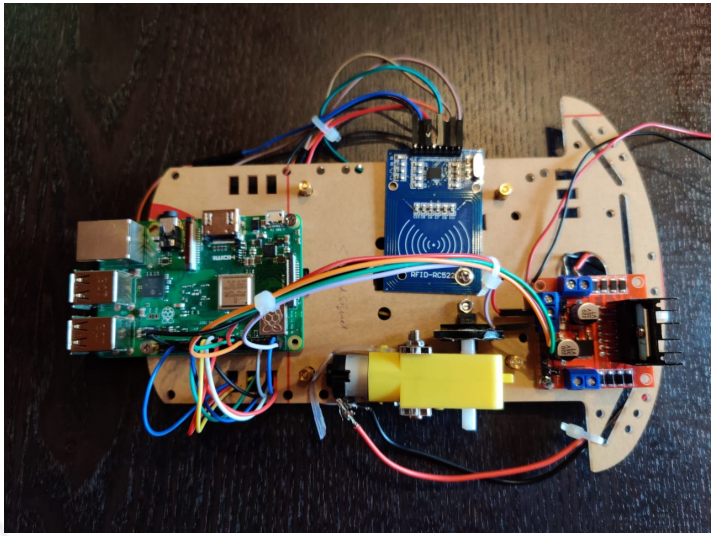
- Create your own images!
- Use tikz; see examples in the template!
- Use preliminary sketches!
- Create flow charts

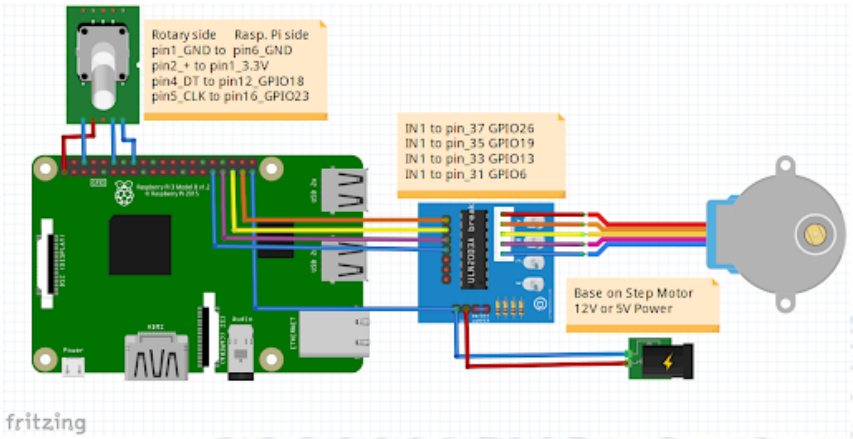
Hardware Description

One task is the description of the hardware.
This also includes the following points:

- Data sheets
- Mechanical dimensions
- Interfaces
- Correct designations
- Description of the mechanical structure
- Circuit diagram
- . . .

Circuit Diagram





List of Parts

- Unique name
- Identifier
- Quantity
- Supplier
- Price
- Informations
- Link
- Availability/Delivery time
- ...

In total, if possible, only one provider

35. Materialliste

Anzahl	Bezeichnung	Link
		
1	NVIDIA Jetson Nano Development Kit-B01	Eckstein-shop.de - SS10417
		
1	NVIDIA Jetson Nano Development Kit-B01	Eckstein-shop.de - WS16990
		
1	WaveShare AC8265 Wireless NIC for Jetson Nano WiFi / Bluetooth	Eckstein-shop.de - WS16576

Software Description

- First of all, create a user manual!
  - The user manual is also used later for testing.
  - It usually does not contain a description of the solution.
- Create test cases!
- Create developer documentation!

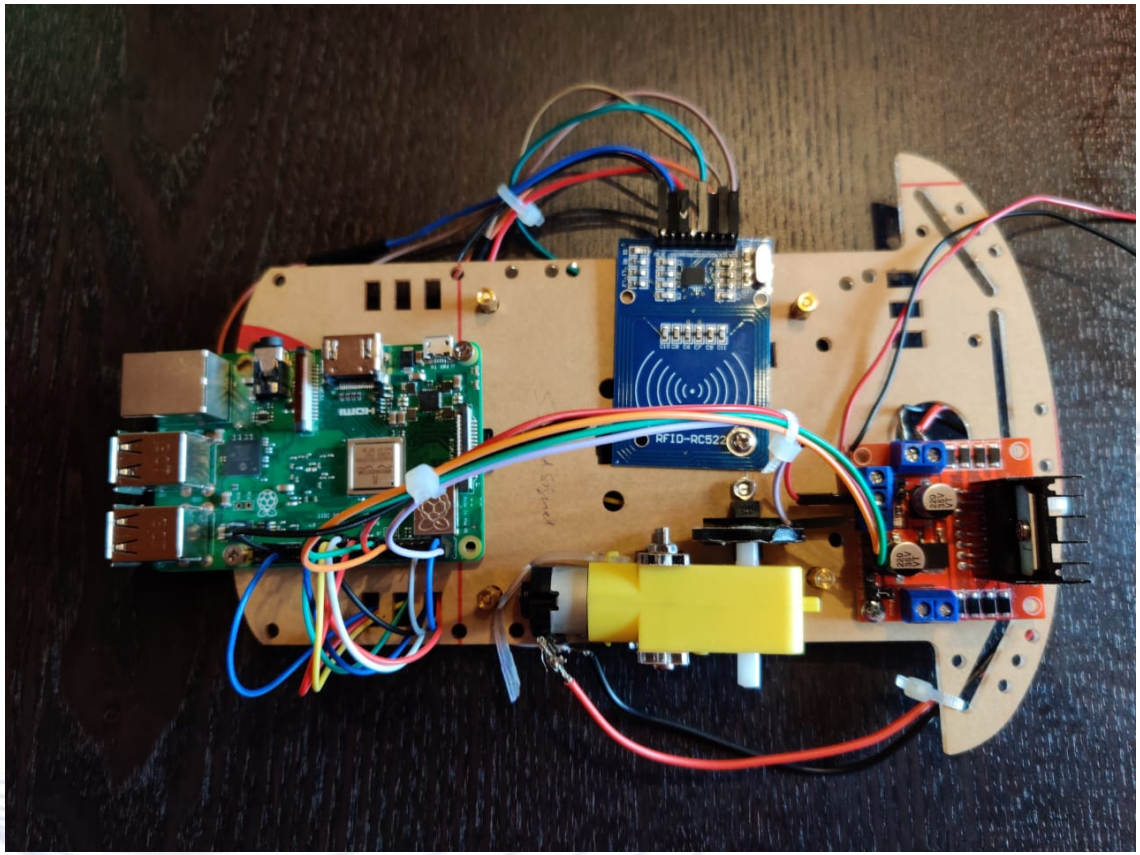
Formalities & General Hints

General Hints

- Use the team for quality control!
- Ensure correct spelling!

Hardware

„Never touch a running system.“



If I do it like this . . .

If I do it like this . . . → Meaning: I know better
If I do it like this . . . → Meaning: It is much more efficient
I have some doubts . . . → Meaning: I save time
My final version . . . → Meaning: I change no more

Source: campushunter

Save your colleagues' and my time!

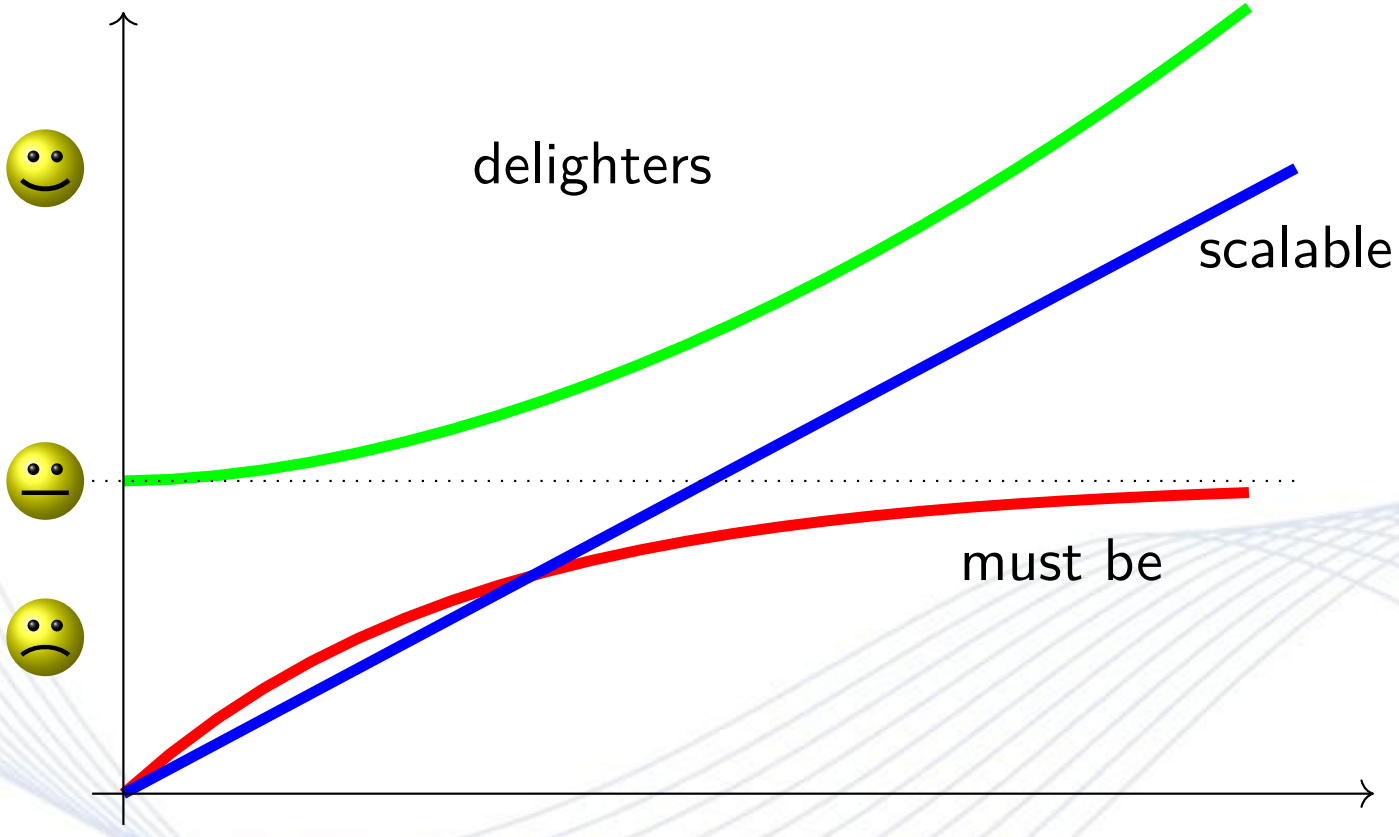
Formalities

- LaTeX
- Delivery of all files
- Spelling
- Websites as pdf files
- README.md
- author.xlsx
- ...

Source: printerest

Formalities are minimum requirements!

Formalities are minimum requirements!



Formalities are minimum requirements! - To Be in Time

Unabhängige und überparteiliche Tageszeitung

77. JAHRGANG, NR. 278 — DIENSTAG, DEN 29. NOVEMBER 2022 — 1,90 €

DAS WETTER HEUTE

Regen 8 °C

AUCH DAS NOCH

Schafe blockieren Autobahnzufahrt

und 100 Schafe haben auf einer Autobahnauffahrt in raunschweig für eine veistündige Sperrung ge-rgt. Ein Schäfer habe sei-Herde über eine Straße der Nähe der A39 von ei-r Weide auf eine andere ren wollen, sagte ein Po-eisprecher am Montag. s habe er schon öfter an. Allerdings wusste er ht, dass in dem Bereich e Leitplanken aufge-t wurden. Die Schafe n zwischen die Absper-en, die den Tieren den zu ihrer Wiese ver-ten. Die Polizei muss-Auffahrt sperren, da-e Tiere in Sicherheit hr werden konnten. der Rettungsaktion f der Straße so viel ss die Fahrbahn ge-werden musste.

Sag es durch die Blume: Wenn es um den Tod geht, redet niemand gerne Tacheles. Heinrich Emkes vom Bestattungsinstitut von Halle in Aurich muss deshalb manchmal Übersetzungshilfe leisten. FOTO: OPTUES

Wie man die letzten Dinge regelt

Die Klärung der letzten Dinge schieben viele Ostfriesen gerne vor sich her. Mal ist der Zeitpunkt zu früh, mal fehlen angeblich die erforderlichen Informationen. Tatsächlich scheuen die meisten Menschen die Beschäftigung mit dem eigenen Tod. Unsere Zeitung hat mit einem Bestatter in Aurich, einem Pastor und einer Verbandssprecherin darüber geredet, wie man diese Beklemmung in den Griff bekommt. Ganz wichtig: Es gibt gute Gründe dafür, jetzt schon seinen Nachlass zu regeln. Und dabei geht es mal nicht ums Geld. Seite 9

Verspätete Schiffsübergabe *stellt Meyer vor Probleme*

INDUSTRIE Finanzielle Lage ist „angespannt" – Beschäftigte erhalten Weihnachtsgeld später

VON MARTIN ALBERTS

Papenburg - Die Papenburger Meyer-Werft muss die Ablieferung ihres aktuellen Neubaus um gut eine Woche verschieben. Die „Arvia" soll nun nicht wie ursprünglich geplant am 1. Dezember, sondern voraussichtlich erst am 9. Dezember an die Reederei P&O Cruises übergeben werden, wie aus einer firmeninternen Mitteilung hervorgeht, die unserer Redaktion vorliegt. Darin heißt es, die finanzielle Situation des Unternehmens sei derzeit „angespannt". Auch für die Beschäftigten hat dies direkte Auswirkungen: Sie erhalten ihr Weihnachtsgeld nun nicht wie gewohnt mit dem Novem-

vielfältig: „Pandemie, Materialengpässe weltweit, Probleme in den Lieferketten, stark gestiegene Energie- und Rohstoffpreise, etc.". Aufgrund der Komplikationen habe man die Übergabe des Kreuzfahrtschiffs an die britisch-amerikanische Reederei P&O Cruises um einige Tage verschieben müssen. Hierüber habe man mit dem Betriebsrat und der Gewerkschaft eine Vereinbarung getroffen, da der größte Teil des Schiffspreises erst bei der Ablieferung vom Kunden an die Werft gezahlt werde. „Wir haben uns das nicht leicht gemacht", sagte Andreas Hensen, der neue Vorsitzende des Meyer-Betriebsrats. Anfang des Monats hatte er das Ans

samtpreises an das Papenburger Unternehmen gezahlt würden, so Hensen. Der dickste Brocken – die übrigen 80 Prozent – kämen erst bei der Lieferung. Die Plattform „Cruise Industry News" beziffert die Baukosten für die „Arvia" –

> „Es war uns wichtig, dass es vor Weihnachten kommt und die Kollegen entsprechend planen können."
> **Andreas Hensen, Betriebsratschef**

wie auch bereits für das

Meyer war aufgrund der Corona-Pandemie und des damit verbundenen Stillstands in der Kreuzfahrtbranche finanziell unter Druck geraten und hatte daraufhin seine Aufträge über längere Zeiträume gestreckt und sich neue Betätigungsfelder – etwa im Bau von Luxusjachten – gesucht. Im internen Schreiben der Werft-Leitung ist jetzt die Rede davon, dass man die Auszahlung des Weihnachtsgeldes kurzzeitig zurückstelle, um die Liquidität des Unternehmens zu entlasten.

„Wir haben eine große Diskussion darüber gehabt – im Betriebsrat und mit der Geschäftsleitung", sagte Hensen. Für die Mitarbeiterinnen und Mitarbeiter, die ihren Weihnachtsbonus bereits fest eingeplant haben und ihn dringend mit der Lohnabrechnung für den November benötigen, wolle man zudem individuelle Lösungen finden, heißt es von der Werft-Leitung. Diesen Schritt lobte auch Thomas Gelder, 1. Bevollmächtigter der IG Metall Leer-Papenburg. Auch für ihn sei es wichtig, dass die übrigen Beschäftigten das Weihnachtsgeld noch vor dem Fest erhalten. Gelder stellte zudem klar: „Das Weihnachtsgeld kommt auf jeden Fall."

So geht dem Garten ein Licht auf

Ostfriesland - Für die A ventszeit wird der Gar gerne mit Lichterket und Leuchtfiguren au rüstet. Wer LED benu kann die Kosten in Gren halten. Unbedingt s man aber darauf ach dass die Beleuchtung Regen oder Schnee ni schlappmacht. Woran n eine winterfeste Lichter te erkennt und wie n diese am besten ver steht auf der heutigen tenseite. Seite

Neue Baustelle in Aurich

Aurich / LU - In der A cher Innenstadt zeich sich die nächste Großb

Teamwork

Source: printerest

Teamwork

Source: printerest

How to Start

How to Start - First Week

1. Choosing a topic
2. Building the infrastructure for the software
3. Creating of the project directory
4. Checking the given documents
5. Building the infrastructure for the project
6. Literature research
7. Creating of the project structure
8. Preparation of the project plan
9. Describing of the task/writing the introduction

How to Start - First Week

1. **Choosing a topic**
   - Reading all possible topics
   - Research on 2-3 topics
   - Determination of the topic
   - Creating of a checklist
2. Building the infrastructure for the software
3. Creating of the project directory
4. Checking the given documents
5. Building the infrastructure for the project
6. Literature research
7. Creating of the project structure
8. Preparation of the project plan
9. Describing of the task/writing the introduction

How to Start - First Week

1. Choosing a topic
2. **Building the infrastructure for the software**
   - Installation of the software
   - Testing of the software
3. Creating of the project directory
4. Checking the given documents
5. Building the infrastructure for the project
6. Literature research
7. Creating of the project structure
8. Preparation of the project plan
9. Describing of the task/writing the introduction

How to Start - First Week

1. Choosing a topic
2. Building the infrastructure for the software
3. **Creating of the project directory**
4. Checking the given documents
5. Building the infrastructure for the project
6. Literature research
7. Creating of the project structure
8. Preparation of the project plan
9. Describing of the task/writing the introduction

How to Start - First Week

1. Choosing a topic
2. Building the infrastructure for the software
3. Creating of the project directory
4. **Checking the given documents**
   → **Reading, reading, reading, ...**
5. Building the infrastructure for the project
6. Literature research
7. Creating of the project structure
8. Preparation of the project plan
9. Describing of the task/writing the introduction

How to Start - First Week

1. Choosing a topic
2. Building the infrastructure for the software
3. Creating of the project directory
4. Checking the given documents
5. **Building the infrastructure for the project**
   - Preparation of the frames for the report/software/documentation
   - Test of the frames
6. Literature research
7. Creating of the project structure
8. Preparation of the project plan
9. Describing of the task/writing the introduction

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5. Building the infrastructure for the project
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⇒ **Successful start of the project**

Successful Start