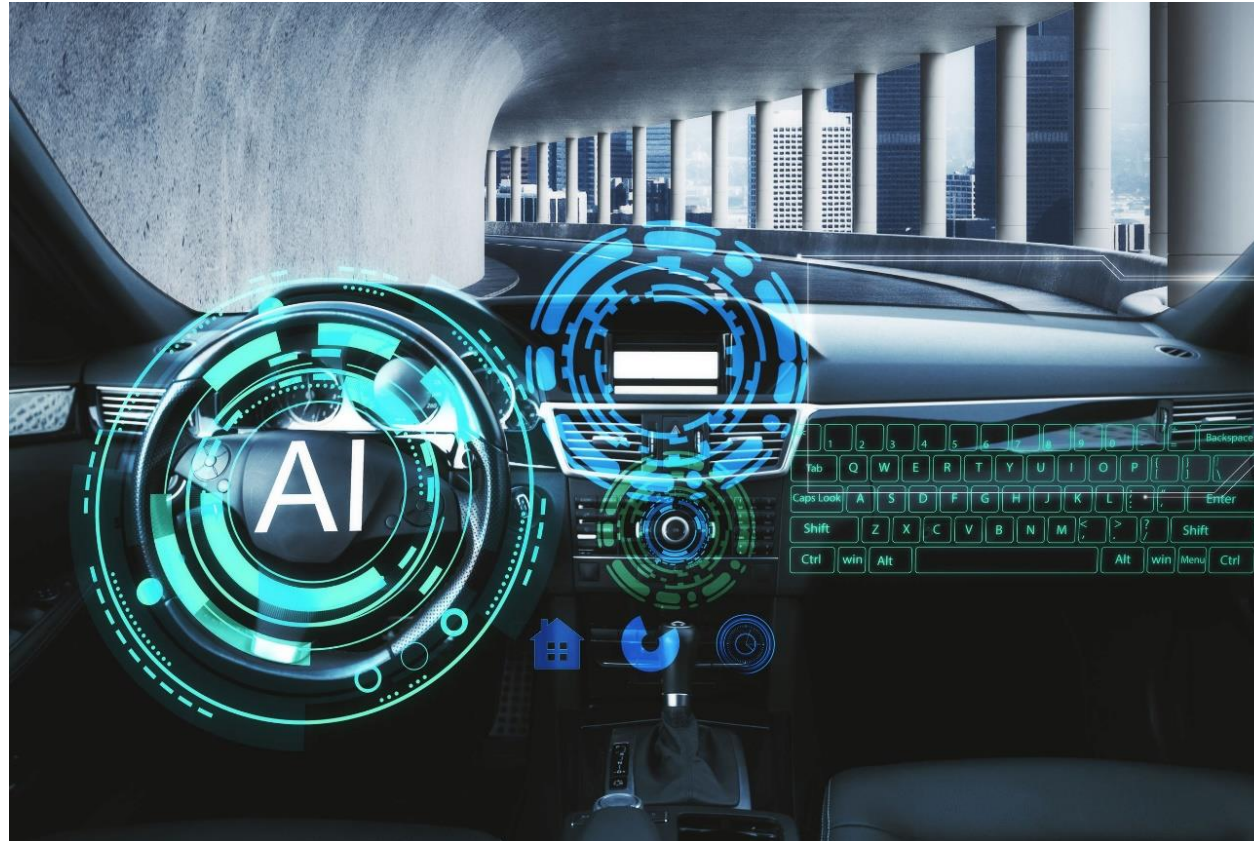


Prof. Dr. Frank J. Furrer

«Engineering Principles for Safety and Security of Cyber-Physical Systems»

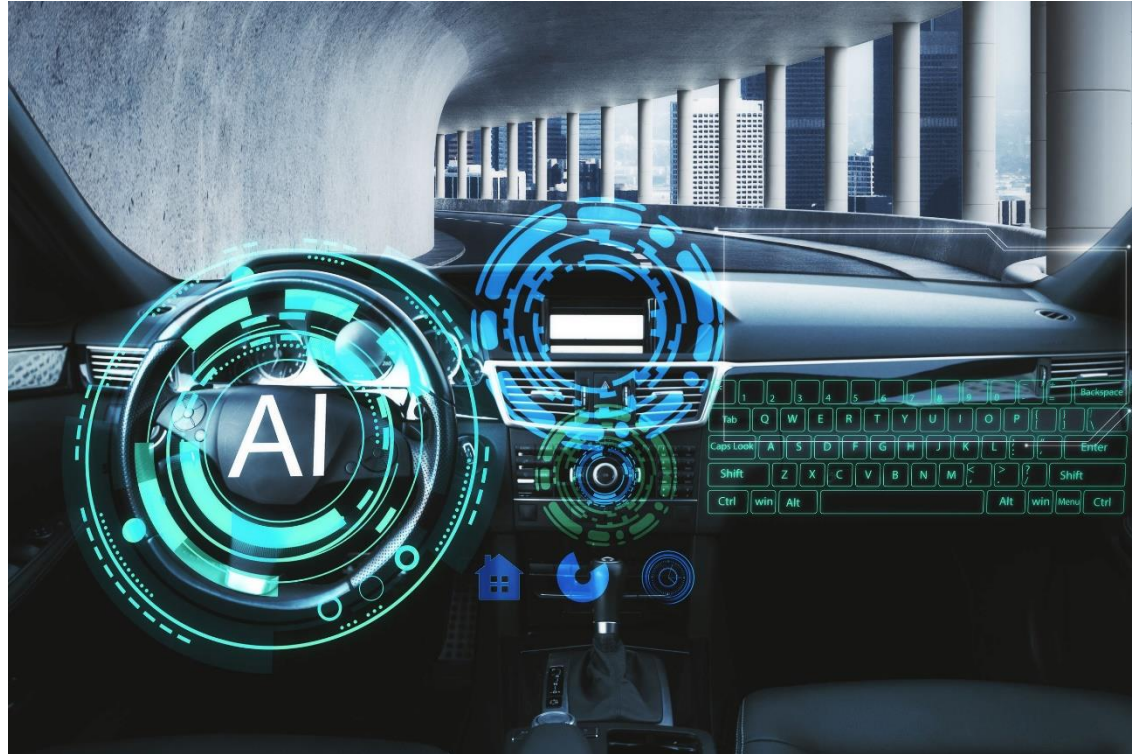


Hauptseminar Day 3: 1. July 2022

© https://www.123rf.com/photo_115434623
Used with permission {28.12.2019}

Schedule Day 3

Name	Presentation	Feedback
Furrer, Frank J.: <i>Introduction</i>	Introduction 09:20 – 10:00	
Leonard Wagner	10:00 – 10:20	10:20 – 10:30
Tom Gneuss	10:30 – 10:50	10:50 – 11:00
Short break	11:00 – 11:15	
Johanna Bernholz	11:15 – 11:35	11:35 – 11:45
Furrer, Frank J.: <i>Final Comments</i>	11:45 -12:40	



Content

Part 1

- Paper Drafts
- Peer Reviews

Part 2

- Presentations
- Feedback

Part 4

- Final Words

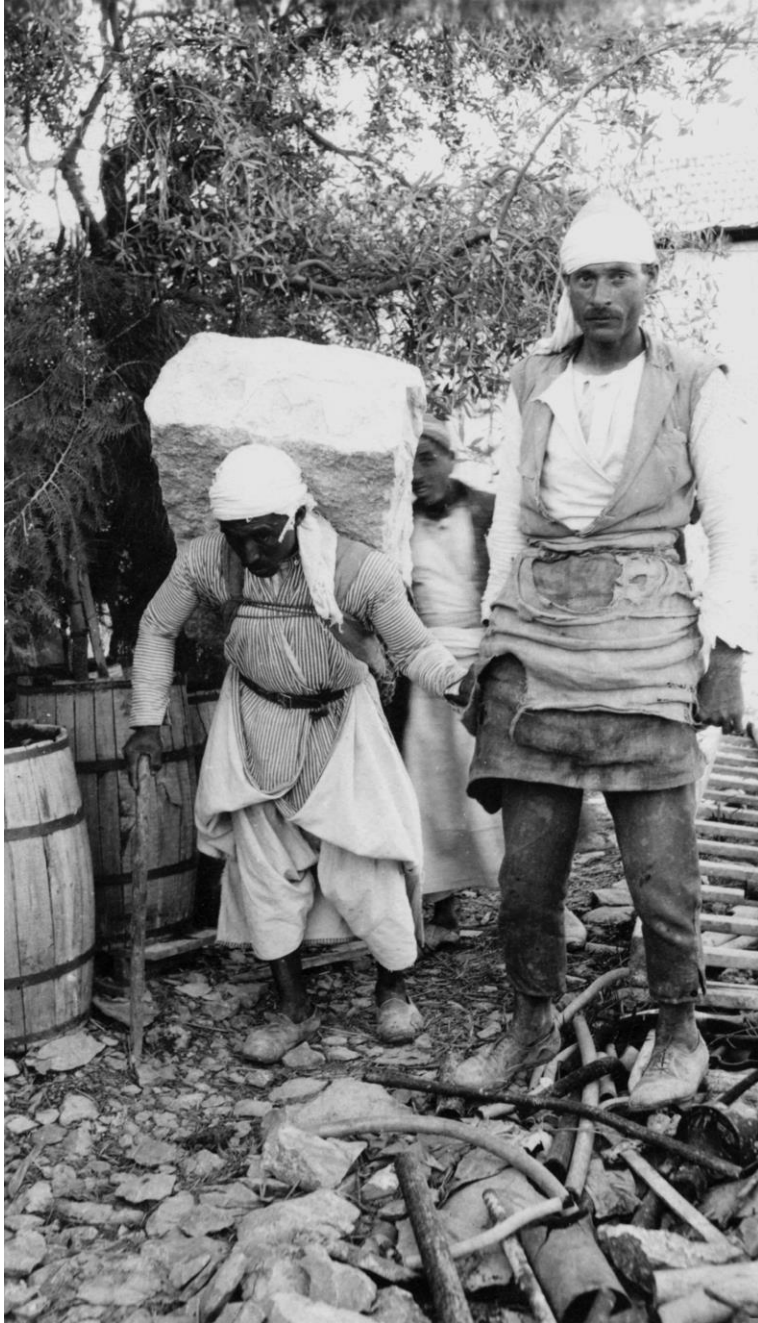
Part 3

- Work Plan
- Next Steps

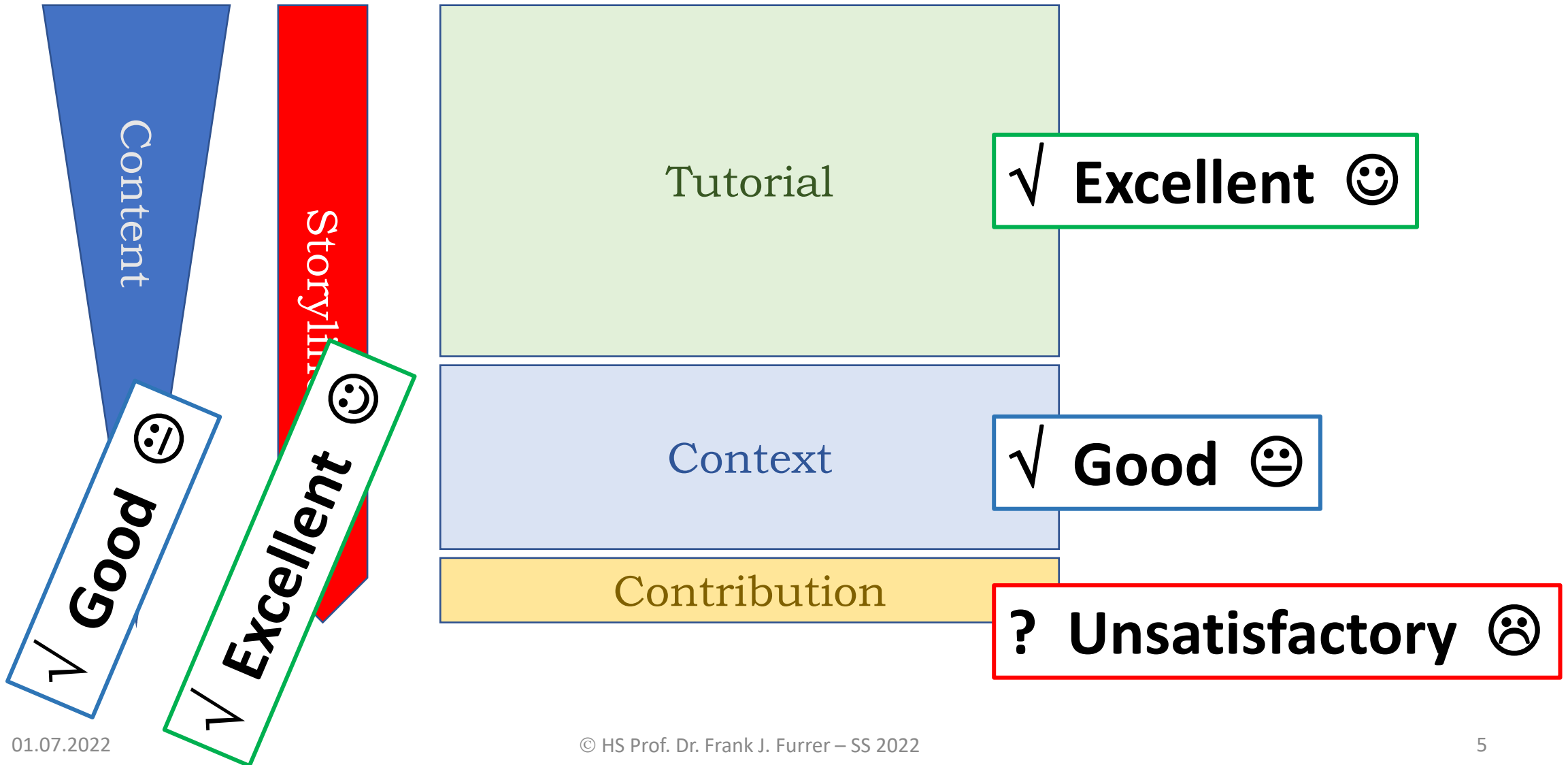
Draft of Paper: Findings

Writing a good paper is really hard work

Time required for a
good paper is
underestimated



Paper Architecture





➤ The author's contribution is short (compared to the page length)

➤ The author's contribution is not sufficiently enlightening

➤ The paper title's promise to the reader is not really honoured

Expressive **figures** are the secret of succesful papers

«One figure says more than 1'000 words»

Ursachen der Irrationalitäten

Suchen wir die tieferen Ursachen dieser gigantischen Verschwendung, der betäubenden Irrationalität, dieser offenbar unaufhaltsamen Abenteurerei. Es gibt mehrere:

Zunächst ist ein Hang zur „Gigantomanie“ zu entdecken, die offensichtlich Politiker und Vorstände besetzt: Alle Bahnanlagen der ganzen Stadt kommen unter die Erde, eine Art Manhattan wird möglich, Stuttgart wird „Metropole“. München und Frankfurt., alle anderen Städte, denen dies auch angetragen wurde, lehnten es ab -- nur Stuttgart, sich Bundesweit diskriminiert fühlend, stieg ein. Nun, wo die Zerstörung Platz greift, merken die Bürger, dass sie Opfer werden, Opfer von -- so formulierte es Benedikt Weibel, der ehemalige Vorstand der Schweizer Bundesbahnen -- Geltungssucht und Größenwahn!

Ein zweites Ursachenelement liegt in der DB: es wurde und wird geschickt verborgen: Die DB Planer wussten und wissen, dass das Konzept und dessen Ziele sich gar nicht verwirklichen lassen. Wenn der Bahnbetrieb zu Bauzeiten weiter gehen muss, ist nur eine schmale Baugrube längs des Bahnhofgebäudes möglich, die nur 8 (statt derzeit 17) Gleise erlaubt und beengte Bahnsteige mit schmalen Treppen bedingt. Damit sind die Sicherheit und die Leistungsfähigkeit sowie der Komfort der heutigen Anlagen nicht erreichbar. Wegen vorhandener S-Bahn- und U-Bahn-Tunnel muss der Tiefbahnhof mit Gefälle gebaut werden, was gegen deutsche und internationale Sicherheitsbestimmungen verstößt. Wegen der Tieflagen und der beengten Zu- und Abgänge ist der Brand- und Katastrophenschutz gemäß der Versammlungstätten-Verordnung nicht erreichbar. Warum wurde dies zunächst verschwiegen und erst spät von Mitarbeitern an die Öffentlichkeit gebracht („121 Risiken“, publiziert im Magazin „stern“)? Die DB konterte zunächst mit irreführender Propaganda, verschleierte Gutachten und behauptete unzutreffende Kosten. Seitdem mehr und mehr Experten die Falschbehauptungen der DB kritisieren und sogar Strafanzeigen erstatteten, schweigt sie zu den meisten Vorwürfen.

Damit ist ein viertes Ursachenelement für die aktuelle Lage evident: Die DB AG und ihre Gremien haben unüberwindbare Mauern des Schweigens errichtet und pflegen konsequente Ignoranz gegenüber der Fachwelt der Fachpresse, den anerkannten Experten, dem kritisch gewordenen Publikum und sogar gegenüber dem Bundesrechnungshof und dem wissenschaftlichen Dienst des Deutschen Bundestags. Selbst wohlmeinende Schreiben und Vorschläge werden einfach ignoriert, offensichtlich in der Hoffnung, dass sich Vorschläge, Kritiken und Klagen von selbst erledigen, wenn erst einmal die „Umwkehrbarkeit“ mit maximalen Zerstörungen erreicht ist. Dies erscheint wohl auch deshalb erfolgversprechend, weil in den vergangenen Jahren die Medien dieser Ignoranz weitgehend folgten und kritiklos auch den unglaubwürdigsten Statements der DB folgten. Es gibt nur wenige Ausnahmen, vor allem in Berichten des Magazins „stern“. Aber auch in der ZEIT konnte man jüngst über den geplanten Bahnhof lesen: „weil er ein Symbol der Macht ist... Es geht um Merkel und Grube, um Ehre und Eitelkeiten...“

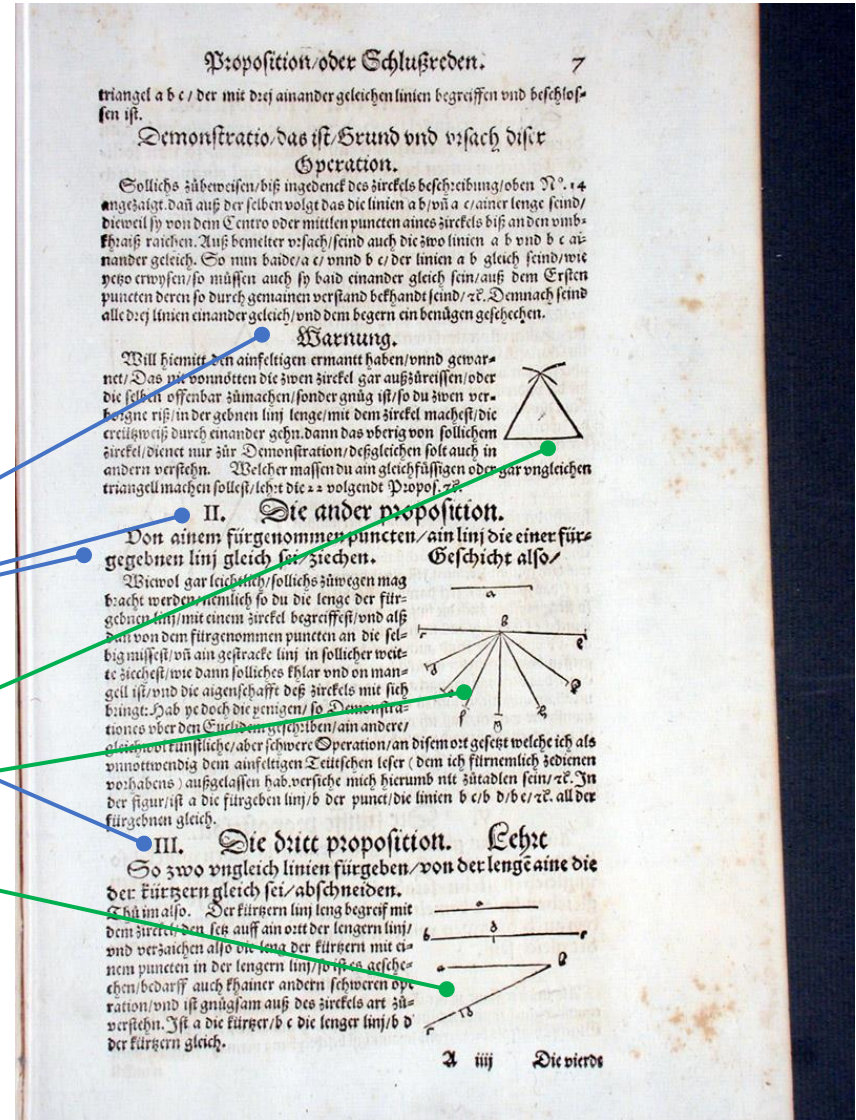
Neben dem Hang zur „Gigantomanie“, die offensichtlich die Promotoren bewegt, kann als weitere Ursache der Reiz des vielen Geldes gesehen werden, ausgelöst durch die Vision, dass Milliarden Euro Steuergelder in diese Stadt fließen sollen -- zum eigenen Vorteil und zu Lasten anderer! Hotels und Gaststätten, Vermieter, die tausende Gastrbeiter für die Tunnelbaustellen beherbergen, Handwerker und Bauunternehmer glauben zu profitieren. Gerade dafür scheinen die Schwaben anfällig: Wirkt hier die Freude eigener Vorteilsnahme, ja vielleicht sogar „Habsucht“, das unablässige Bestreben nach mehr Hab' und Gut -- egal wie viel man schon besitzt?



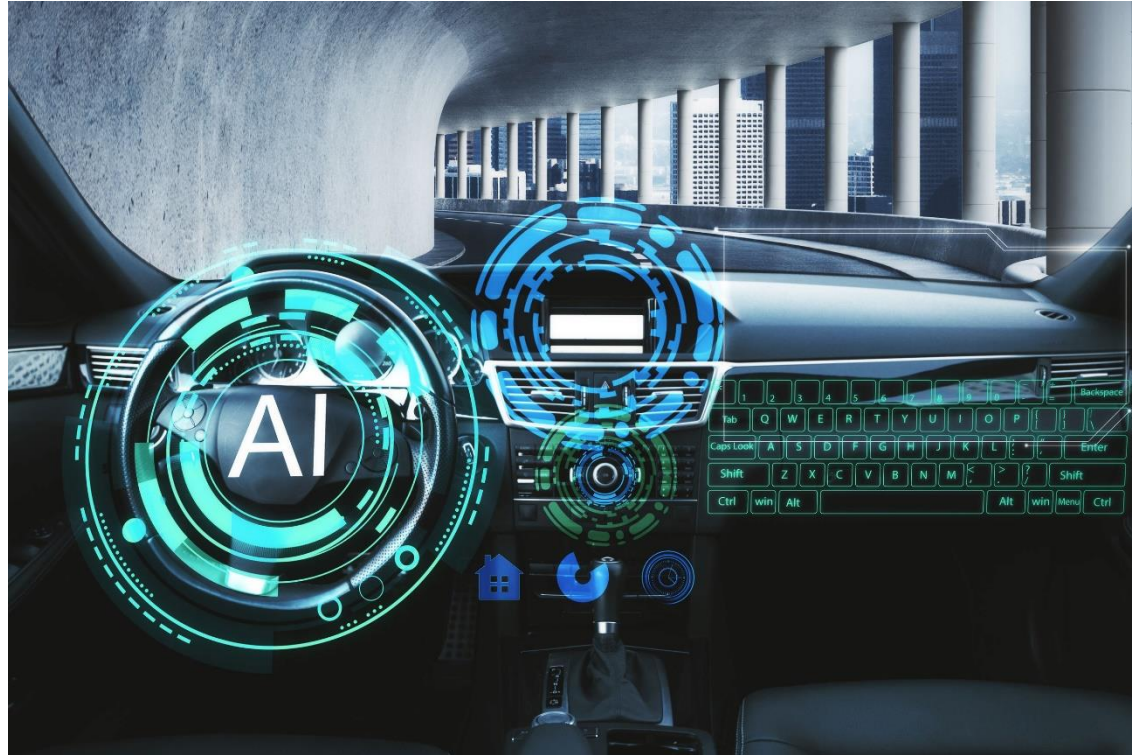
<https://www.heilpraxisnet.de>

Title hierachy and structure

Figures, photos, and illustrations



<http://www.ub.unibas.ch>



Content

Part 1

- Paper Drafts
- Peer Reviews

Part 2

- Presentations
- Feedback

Part 4

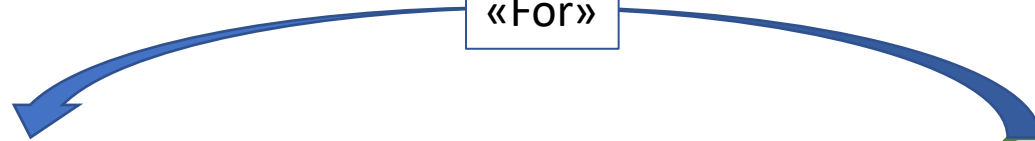
- Final Words

Part 3

- Work Plan
- Next Steps

Paper Peer Reviews: **Remarks**

«For»



Reviewer

Bernholz

Gneuss

Wagner

Bernholz

-

Carefully reviewed, excellent remarks, good support for the author

Highly valuable remarks, will improve the paper significantly

Gneuss

Mainly praise, recommendations and suggestions shorthanded

-

Wertvolle positive, konstruktive Kritik. Zur Länge des Papers aber zu wenig Bemerkungen

Author

Wagner

Positive comments, but few helpful suggestions for the author

Lobende Kommentare, aber deutlich zu wenig konstruktive Kritik, Review zu wenig substantziell

-

3 elements of a helpful review

Paper Peer Reviews: **Remarks**



Praise [Lob]

Constructive Criticism

Warnings

as required

~10%



- specific
- precise

~80%

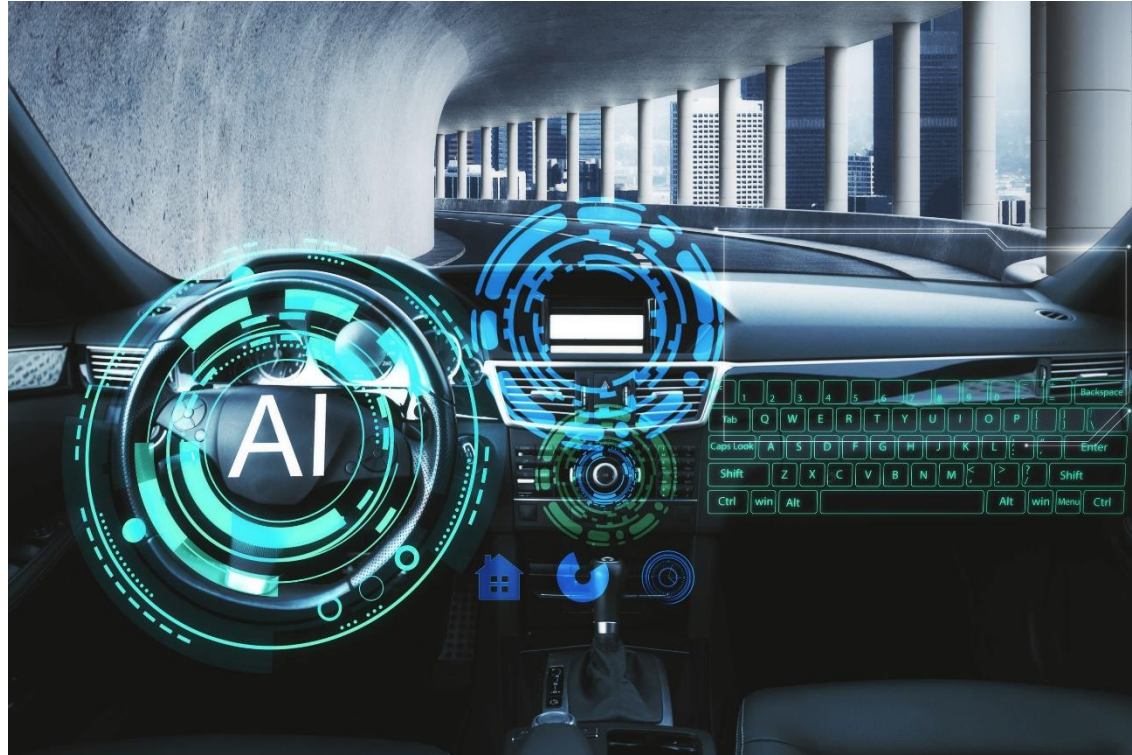


<https://baylorlariat.com>

- targetted
- accurate



- justified
- unbiased



Content

Part 1

- Paper Drafts
- Peer Reviews

Part 2

- Presentations
- Feedback

Part 4

- Final Words

Part 3

- Work Plan
- Next Steps

Schedule Day 3

Name	Presentation	Feedback
Furrer, Frank J.: <i>Introduction</i>	Introduction 09:20 – 10:00	
Leonard Wagner	10:00 – 10:20	10:20 – 10:30
Tom Gneuss	10:30 – 10:50	10:50 – 11:00
Short break	11:00 – 11:15	
Johanna Bernholz	11:15 – 11:35	11:35 – 11:45
Furrer, Frank J.: <i>Final Comments</i>	11:45 -12:40	

Procedure

Presentation
(15-20 mins)

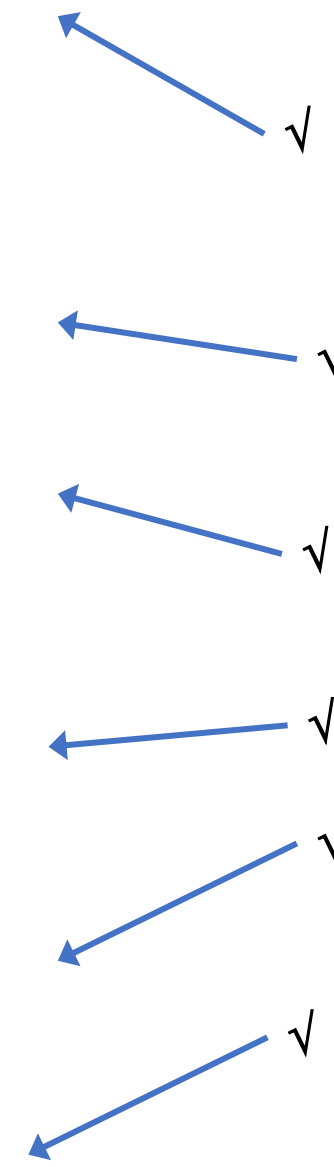


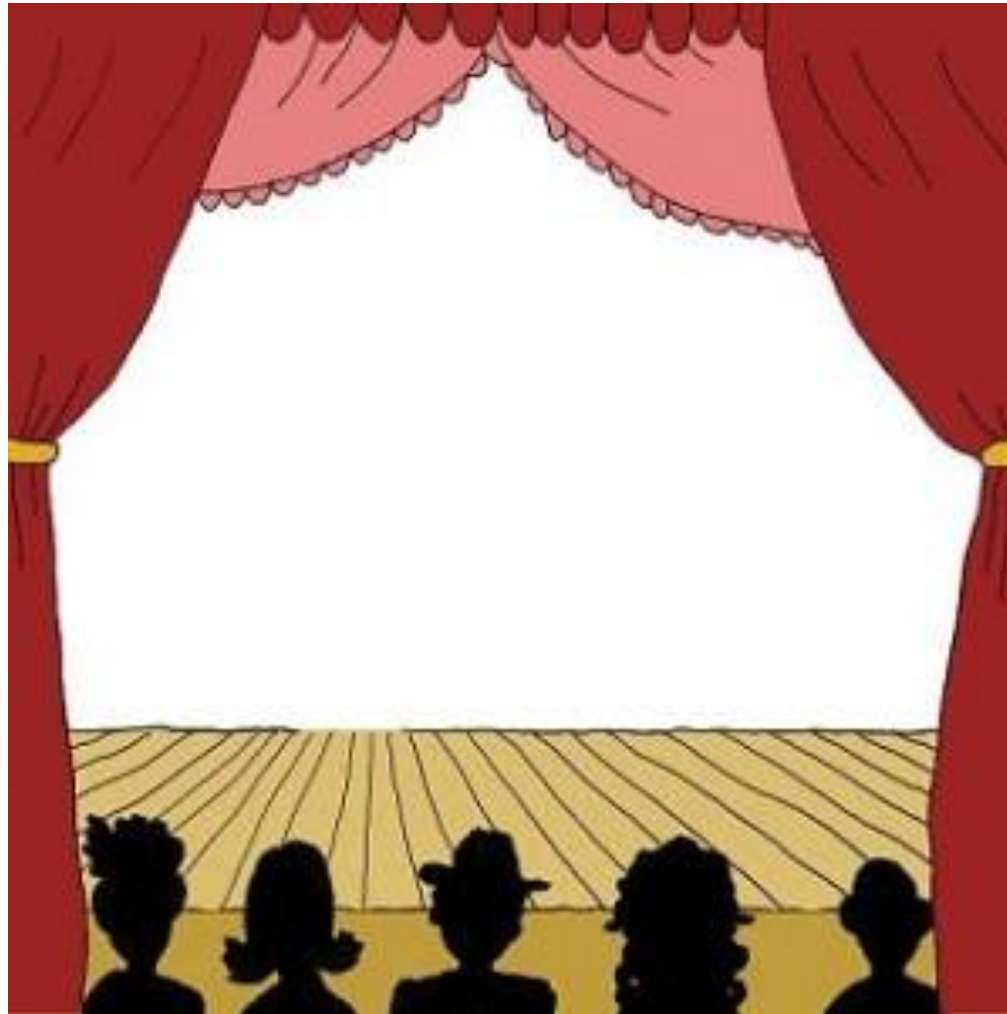
<http://magneticspeaking.com/blog/>

Audience
Feedback
(10 mins)

Storyline	<ul style="list-style-type: none"> Logical Consistent Attractive Clear 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>
Illustrations Pictures	<ul style="list-style-type: none"> Fitting/Adequate Granularity Power of Expression Support of Speaker 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>
Animation	<ul style="list-style-type: none"> Focussed (emphasizing the message of the slide) Speed Unnecessary effects Timing 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>
Density	<ul style="list-style-type: none"> Too dense (per slide or per time unit) Too slow (more material per slide or per time unit) Balance of slides Bullet point lists 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>
Delivery	<ul style="list-style-type: none"> Personal style Interaction with the audience Complementary speech/illustrations 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>

Storyline	<ul style="list-style-type: none"> • Logical • Consistent • Attractive • Clear 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>
Illustrations Pictures	<ul style="list-style-type: none"> • Fitting/Adequate • Granularity • Power of Expression • Support of Speaker 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>
Animation	<ul style="list-style-type: none"> • Focussed (message of the slide) • Speed • Unnecessary effects • Timing 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>
Density	<ul style="list-style-type: none"> • Too high • Too low • Balance of slides • Bullet point lists 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>
Delivery	<ul style="list-style-type: none"> • Personal style • Interaction with the audience • Complementary speech/illustrations 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>
Message	<ul style="list-style-type: none"> • Precise • True • „catching“ 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>





... the stage is yours!

Leonard Wagner
 Presentation 2
 01.07.2022

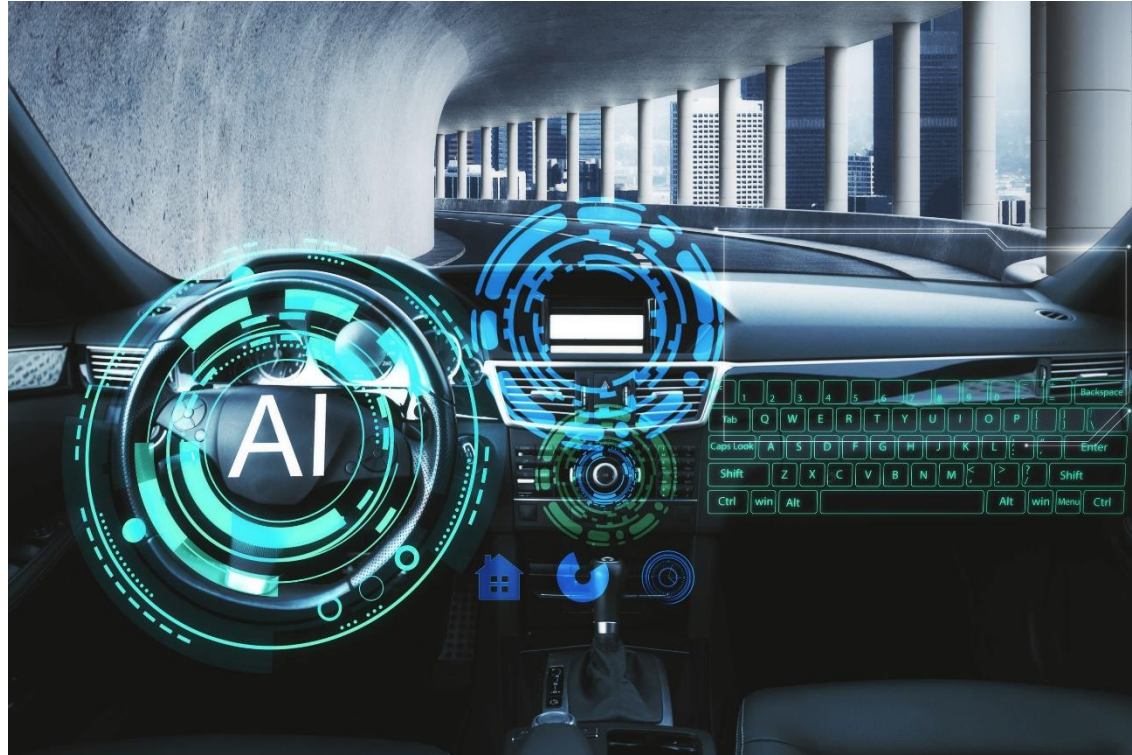
Storyline	<ul style="list-style-type: none"> • Logical • Consistent • Attractive • Clear 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Illustrations Pictures	<ul style="list-style-type: none"> • Fitting/Adequate • Granularity • Power of Expression • Support of Speaker 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Animation	<ul style="list-style-type: none"> • Focussed (message of the slide) • Speed • Unnecessary effects • Timing 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Density	<ul style="list-style-type: none"> • Too high • Too low • Balance of slides • Bullet point lists 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Delivery	<ul style="list-style-type: none"> • Personal style • Interaction with the audience • Complementary speech/illustrations 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Message	<ul style="list-style-type: none"> • Precise • True • „catching“ 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓

Tom Gneuss
 Presentation 2
 01.07.2022

Storyline	<ul style="list-style-type: none"> • Logical • Consistent • Attractive • Clear 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Illustrations Pictures	<ul style="list-style-type: none"> • Fitting/Adequate • Granularity • Power of Expression • Support of Speaker 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Animation	<ul style="list-style-type: none"> • Focussed (message of the slide) • Speed • Unnecessary effects • Timing 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Density	<ul style="list-style-type: none"> • Too high • Too low • Balance of slides • Bullet point lists 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Delivery	<ul style="list-style-type: none"> • Personal style • Interaction with the audience • Complementary speech/illustrations 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Message	<ul style="list-style-type: none"> • Precise • True • „catching“ 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓

Johanna Bernholz
 Presentation 2
 01.07.2022

Storyline	<ul style="list-style-type: none"> • Logical • Consistent • Attractive • Clear 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Illustrations Pictures	<ul style="list-style-type: none"> • Fitting/Adequate • Granularity • Power of Expression • Support of Speaker 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Animation	<ul style="list-style-type: none"> • Focussed (message of the slide) • Speed • Unnecessary effects • Timing 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Density	<ul style="list-style-type: none"> • Too high • Too low • Balance of slides • Bullet point lists 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Delivery	<ul style="list-style-type: none"> • Personal style • Interaction with the audience • Complementary speech/illustrations 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓
Message	<ul style="list-style-type: none"> • Precise • True • „catching“ 	Excellent <input type="checkbox"/> Good <input type="checkbox"/> Improvable <input type="checkbox"/>	✓



Content

Part 1

- Paper Drafts
- Peer Reviews

Part 2

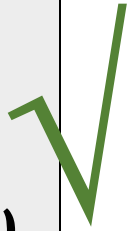
- Presentations
- Feedback

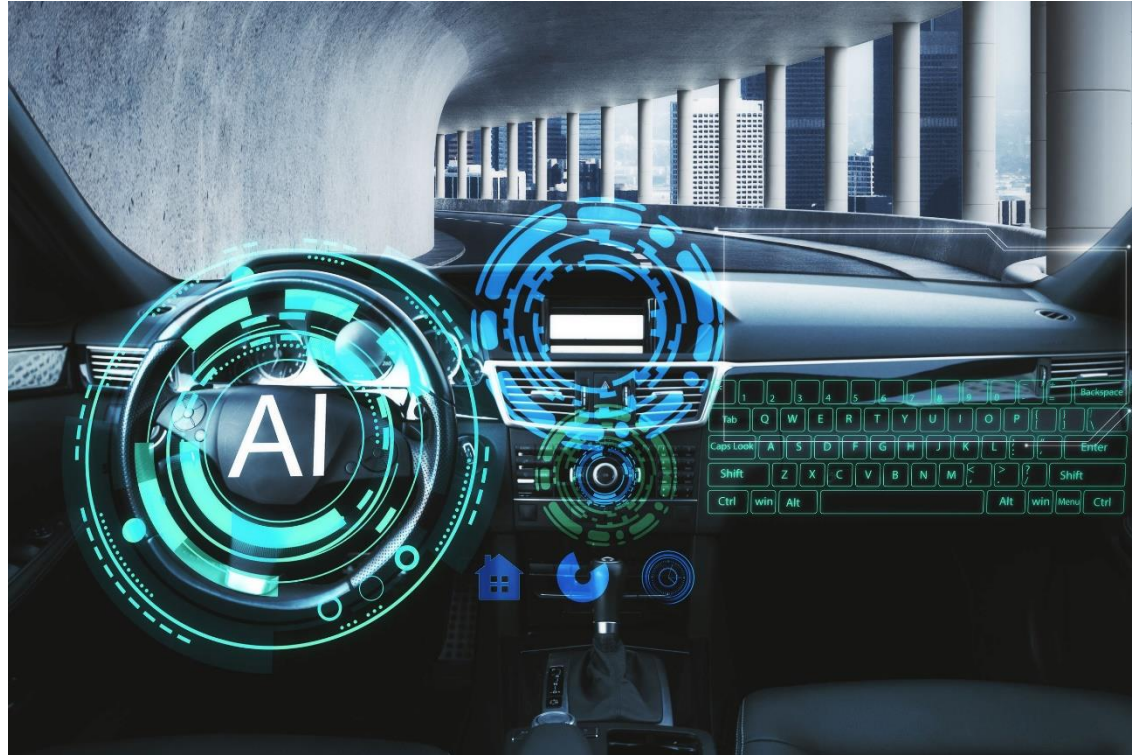
Part 4

- Final Words

Part 3

- Work Plan
- Next Steps

Hauptseminar Day 3 Meeting	Friday, July 1, 2022: 09:20 – 10:50/11:10 – 12:40 (2. + 3. DS), Room APB/INF 2101 
Deliver final version of your paper (WORD, pdf or LaTeX) Deliver final version of your presentation (ppt or pdf)	<u>Latest:</u> Friday, July 15, 2022
Receive assessment, grade and credits (by e-Mail)	Latest: Friday, July 22, 2022



Content

Part 1

- Paper Drafts
- Peer Reviews

Part 2

- Presentations
- Feedback

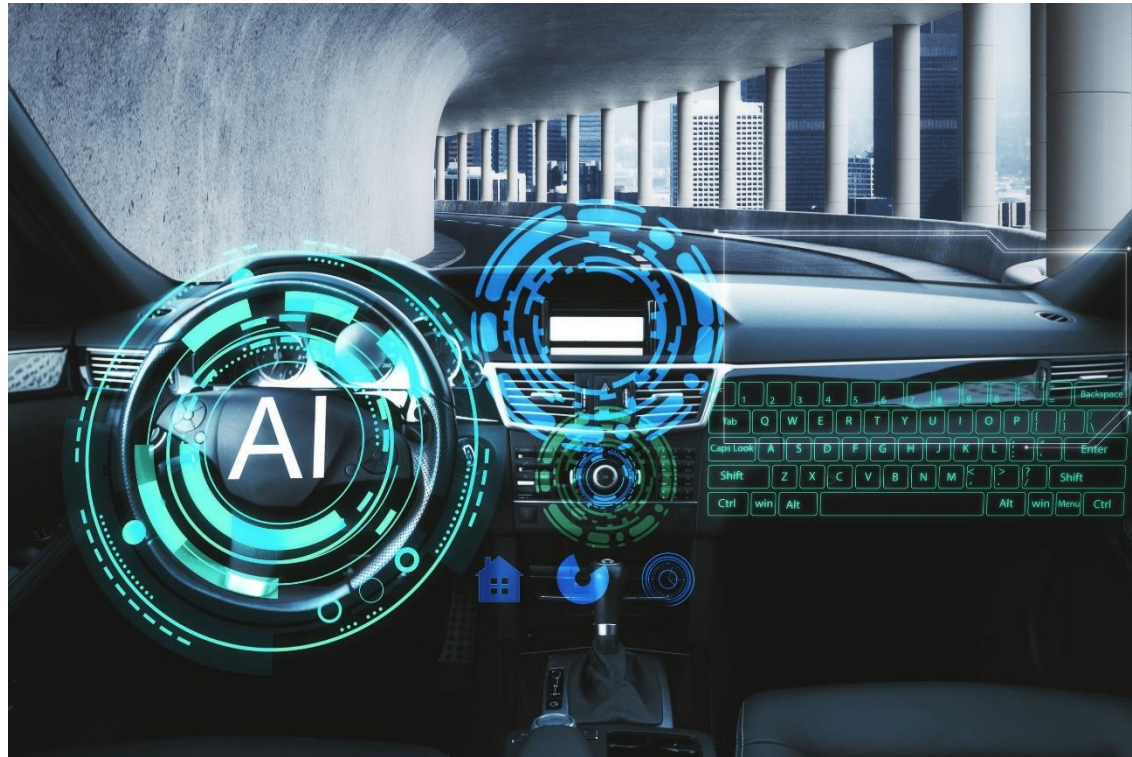
Part 3

- Work Plan
- Next Steps

Part 4

- Final Words

- ✓ Soft Skills
- ✓ Personality
- ✓ Burn-Out



Content

Part 1

- Paper Drafts
- Peer Reviews

Part 2

- Presentations
- Feedback

Part 3

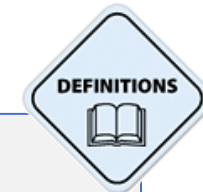
- Work Plan
- Next Steps

Part 4

- Final Words

- ✓ Soft Skills
- ✓ Personality
- ✓ Burn-Out

Soft Skills



Soft Skills =

Personal attributes that enable someone to interact
effectively and harmoniously with other people.

<http://www.oxforddictionaries.com>

Soft Skills

„The fundamental principle behind any *soft skill* is to cultivate the perception in **other people's minds** that they can gain and benefit by engaging with us“

[Wushow Chou 2013, ISBN 978-1-118-52178-6]

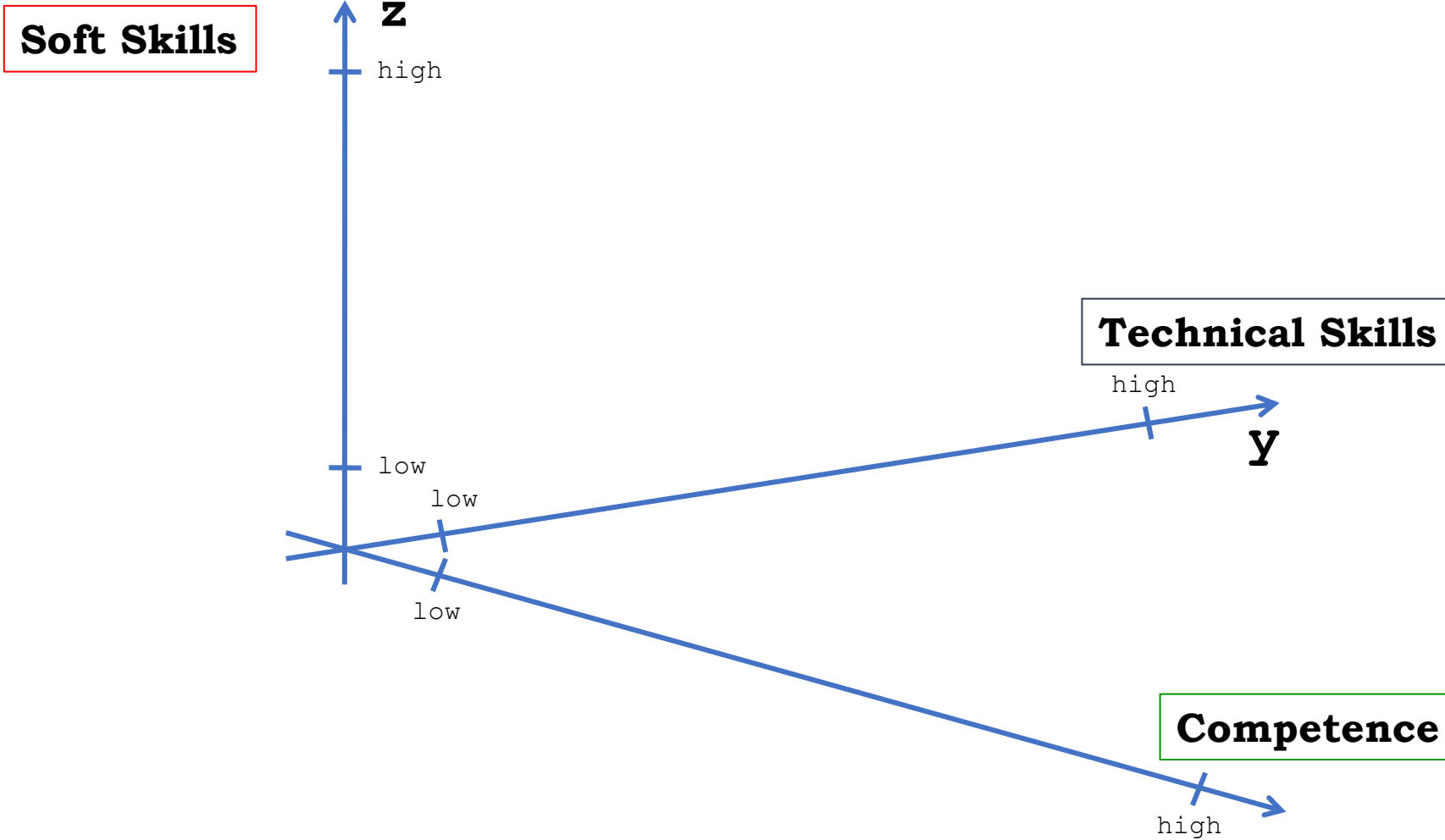
Fast-Tracking Your Career

Soft Skills for Engineering and IT Professionals

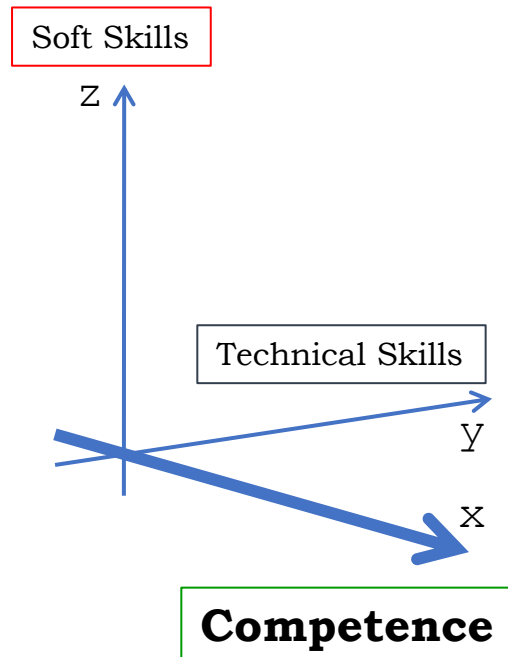
Wushow "Bill" Chou



Skills Coordinate System



Skills: **Competence**



(Professional) Competence

- IT (architecture) knowledge
- IT (practical) experience
- State-of-the-Art knowledge (broad, hardware, software, processes)
- Technology mastering (HW & SW)
- Business knowledge
- Innovation capability
- Implementation power & persistence
- Vision

Competence: Life-Long Learning

„Half-Life of IT-Engineering Knowledge“

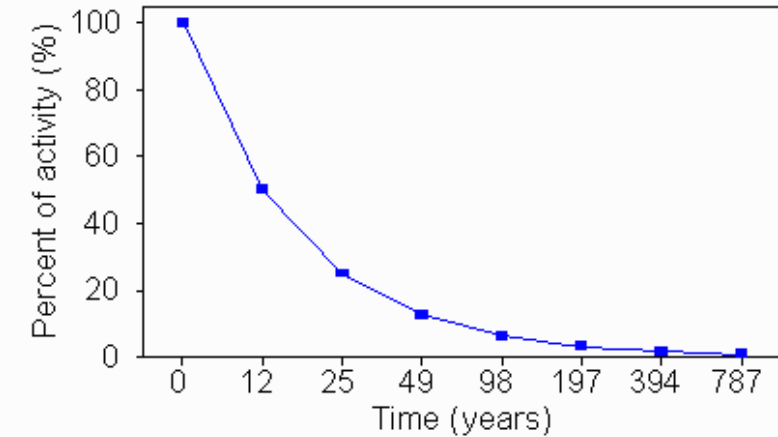
Which is the half-life of IT-engineering knowledge ?

Def: The time-span after which *half* of your current IT-knowledge has become obsolete

[→ as a marketable, personal asset]

Decay Curve for Tritium

Amount of radioactivity vs time



<http://www.chem.csustan.edu/chem3070/3070m04.htm>

Field	Half-life (in years)
Physics	13
Mathematics	9
Economics	9
Computer Science	6

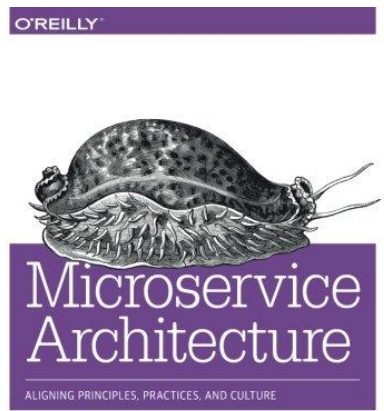
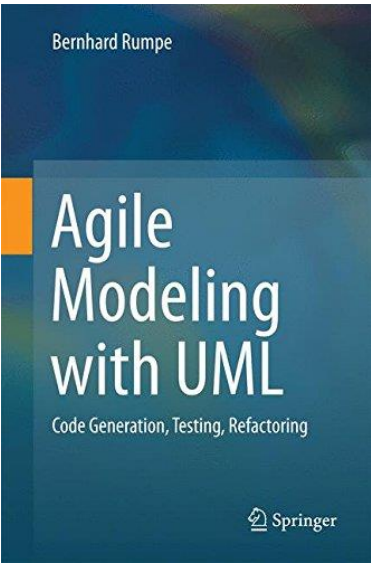
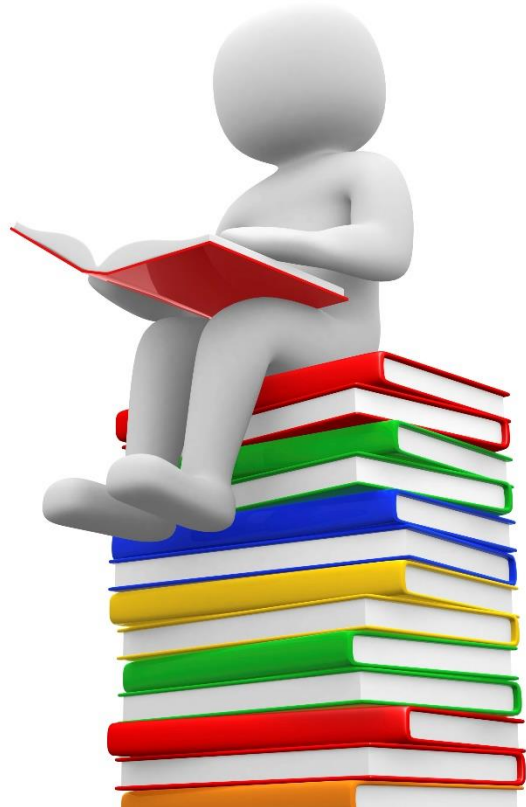
Competence: Life-Long Learning

„Half-Life of IT-Engineering Knowledge“: **6 years**

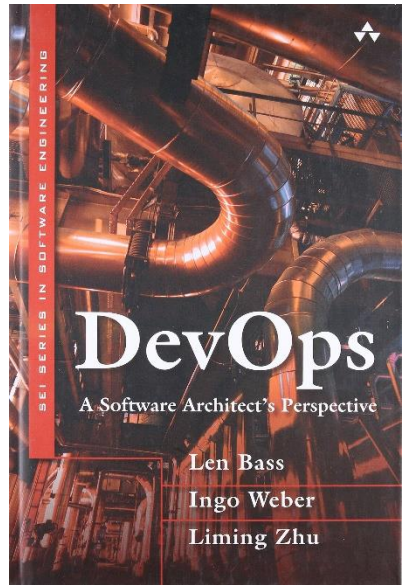
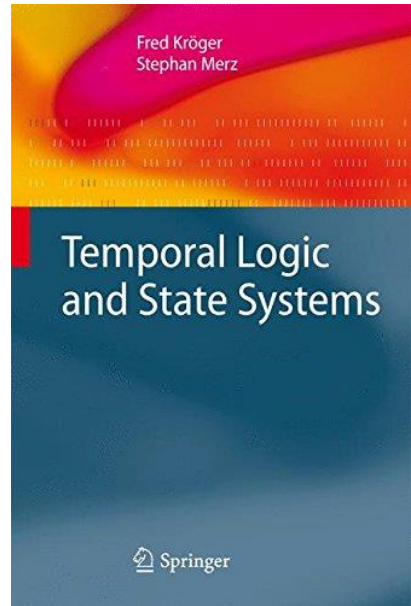
Remedy: Read ≥ 8 textbooks per year

≥ 6 Books in your professional field

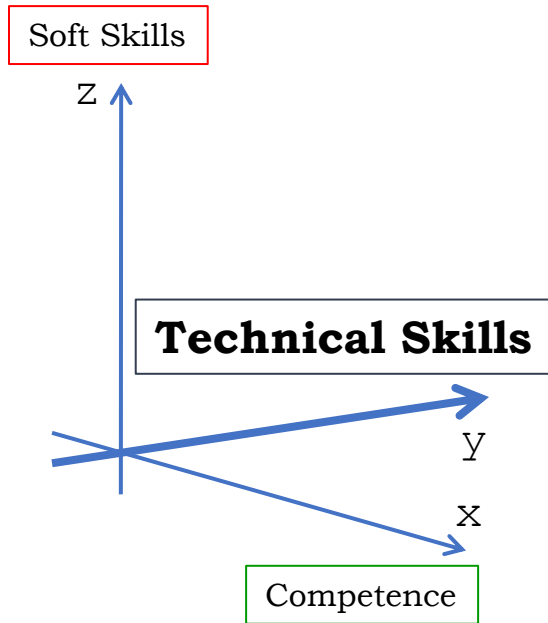
≥ 2 Books in a related field



etc.



Skills: **Technical Skills**



Technical Skills

- Communication skills (speech & writing)
- Presentation skills (oral, graphical & writing)
- Logical reasoning capability
- Efficiency & effectiveness
- Languages
- „Architecture Feel“ (Simplicity & beauty)

Efficiency:

Doing the things right

Effectiveness:

Doing the right things

Important: **Communications skills**

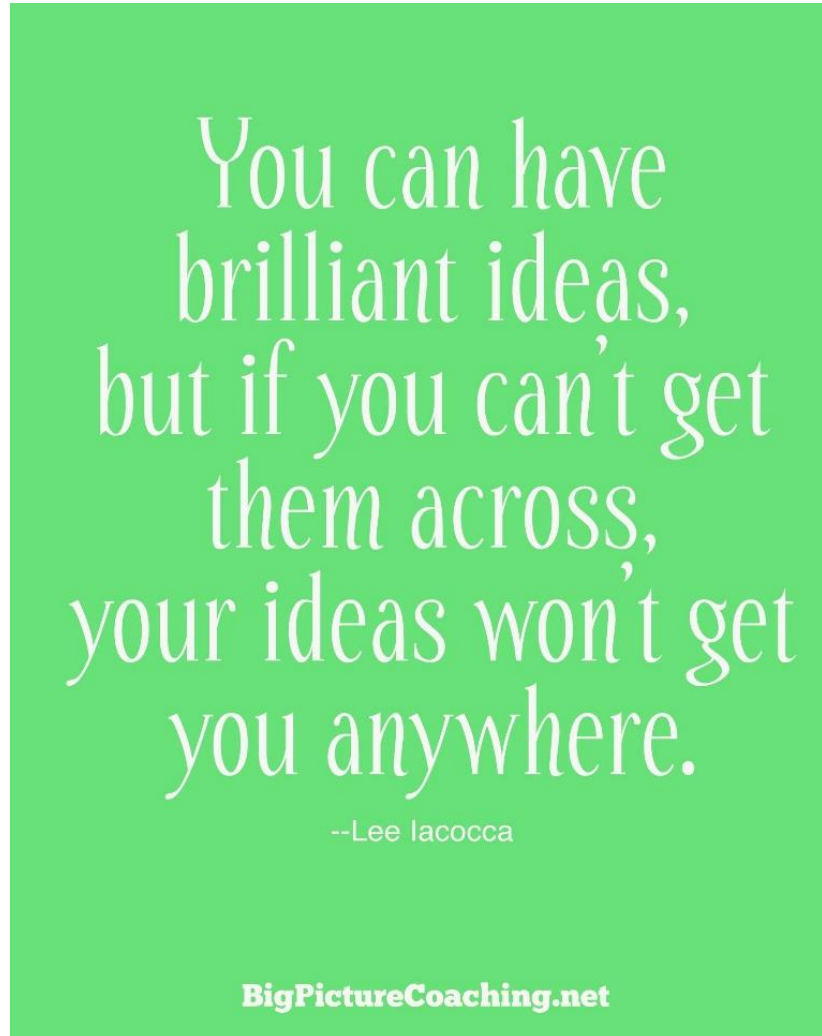
Writing:

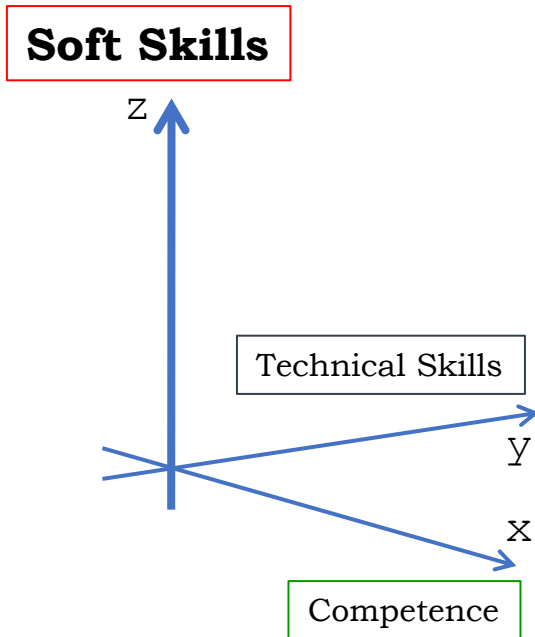
- Papers
- Reports
- Proposals
- Books
- Reviews
- ...



Presenting:

- Results
- Proposals
- Requests
- Milestones
- Failures
- ...





Soft Skills

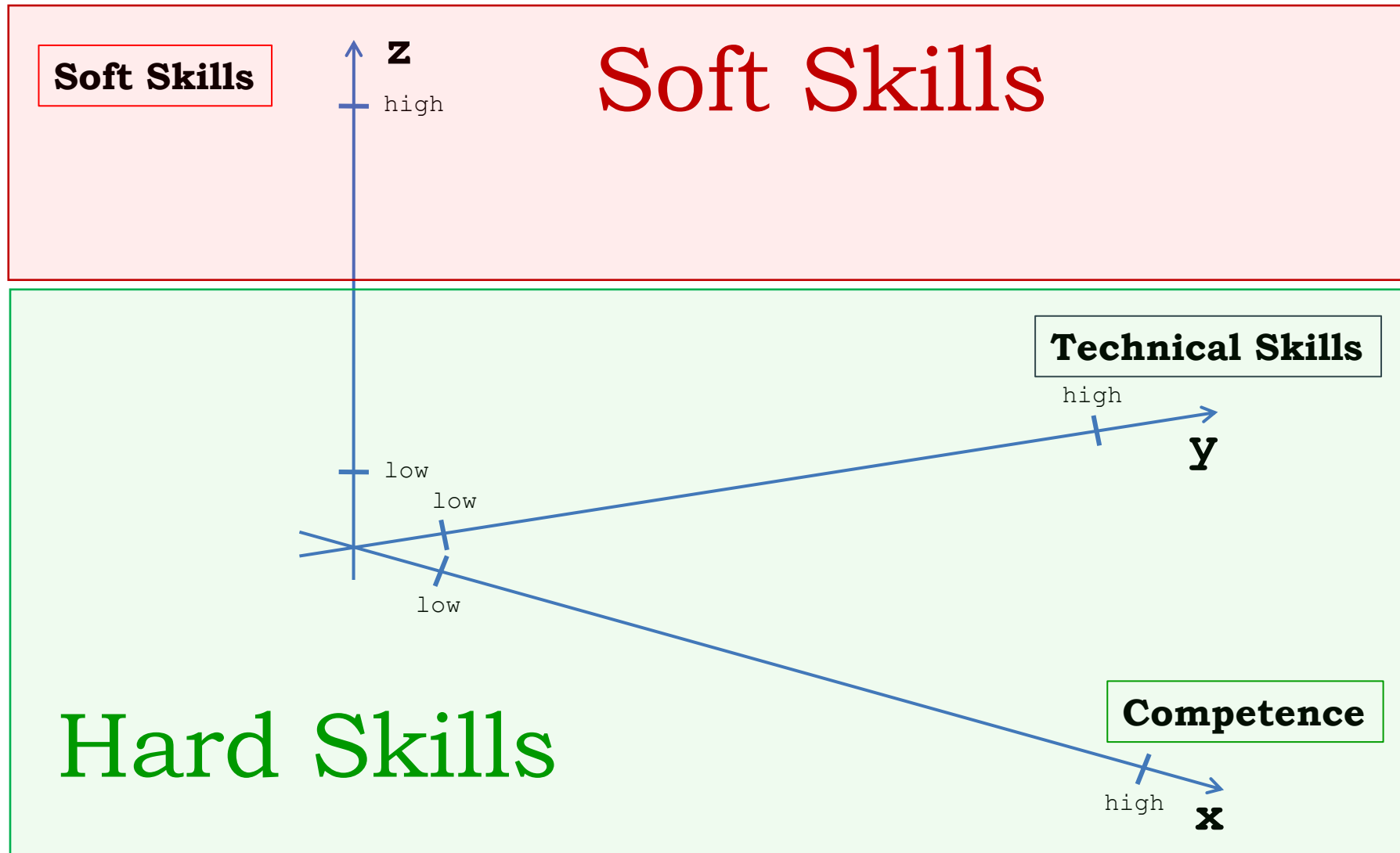
- Negotiation skills
- Persuasion capability
- People interaction capability
- Enthusiasm
- Leadership
- Life-long learning
- Socializing/Networking
- Team Work
- Honesty (Ethics)

• Work-life balance

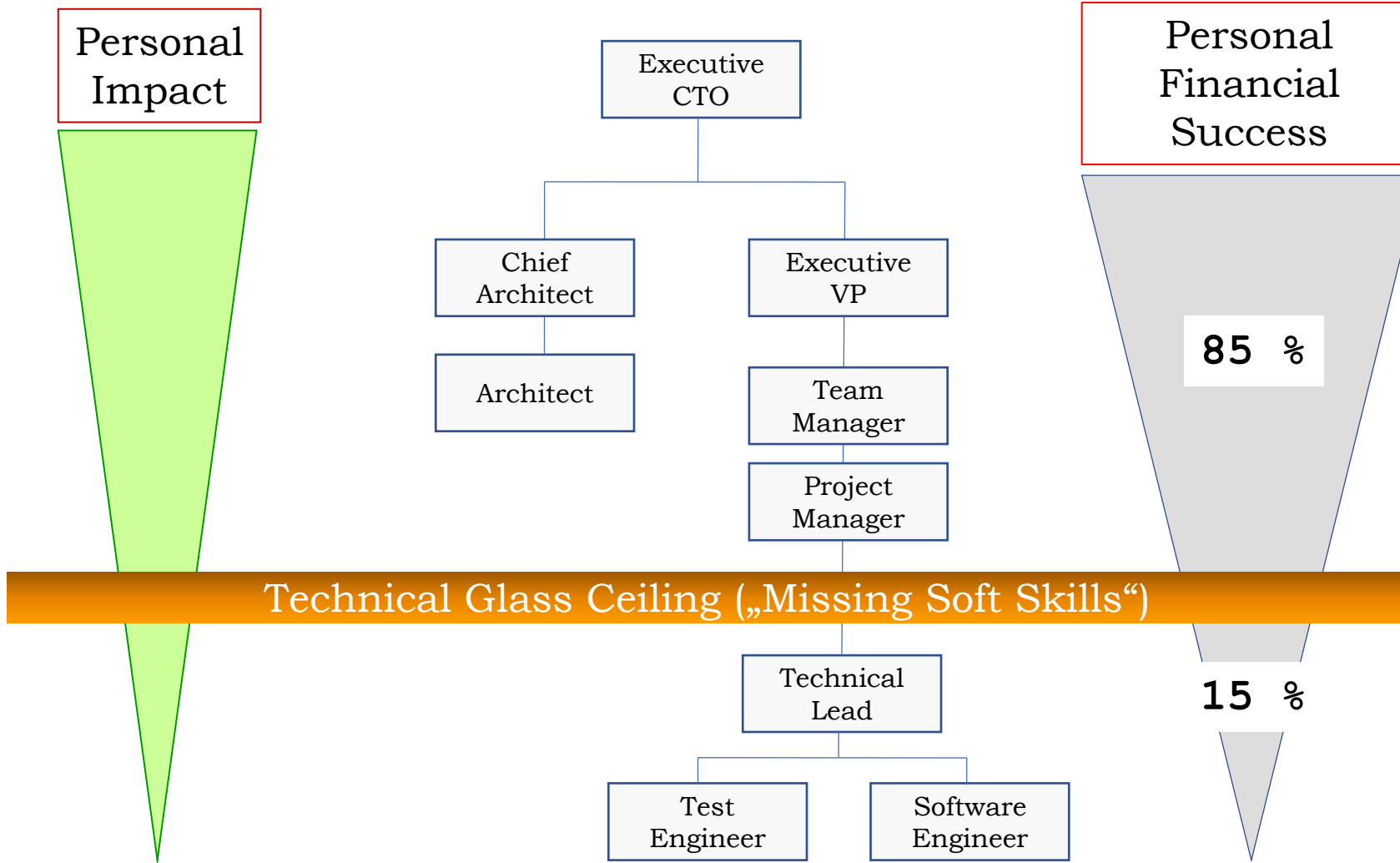


<http://samingersoll.com/life-work-balance/>

Skills Coordinate System



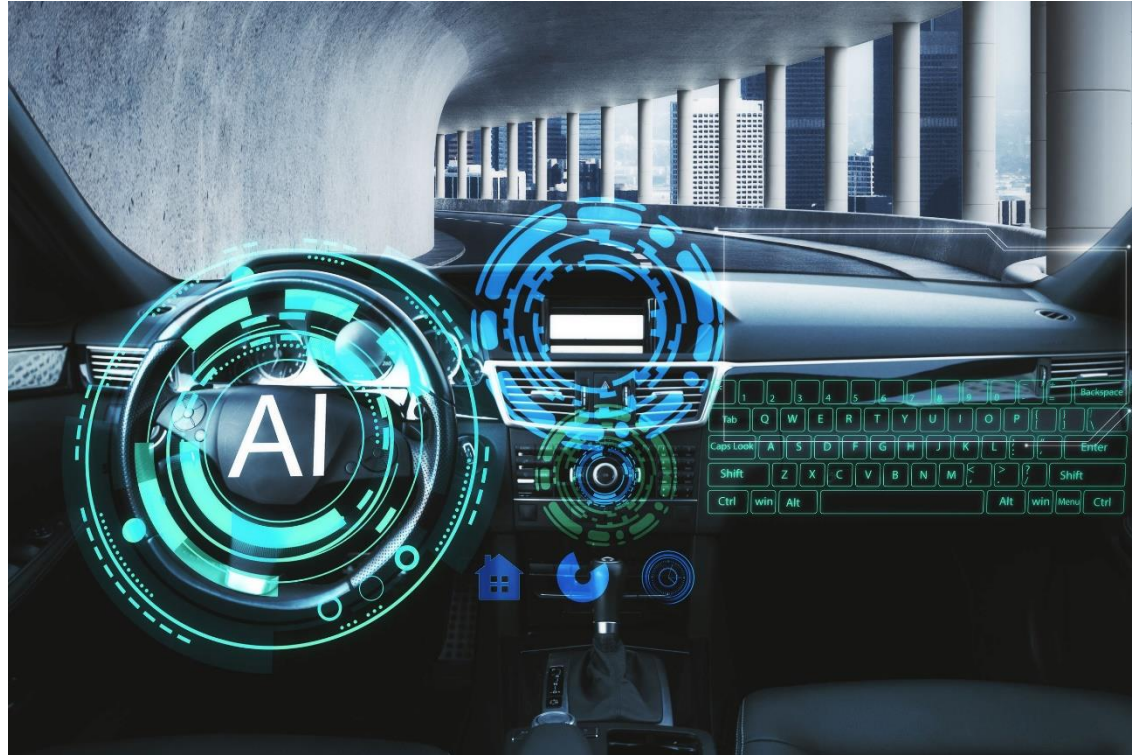
Hard Skills ↔ Soft Skills: Which are more important?



<https://www.open.edu>

Dave Hendricksen, 2012, ISBN 978-0-321-71729-0

Dale Carnegie, 1937
ISBN 978-1-4391-9919-0



Content

Part 1

- Paper Drafts
- Peer Reviews

Part 2

- Presentations
- Feedback

Part 3

- Work Plan
- Next Steps

Part 4

- Final Words

- ✓ Soft Skills
- ✓ Personality
- ✓ Burn-Out

Personality

Personality



Context-dependent:

- ❖ Father
- ❖ Teacher
- ❖ Policeman
- ❖ ...



Important Concept_

The Role

Personality:

The combination of characteristics or qualities that form an individual's distinctive character

[The New Oxford Dictionary of English]



Example: Future-Proof Software-Systems Engineer Personality

Mission:

The future-proof software-systems engineer

guides, consults, and **forces** the development teams

to build and maintain

sustainable, trustworthy, efficient, and **effective** software-systems

Photo Credit: Silvia Furrer



Courage

Fighting Spirit

<http://www.wildanimalfightclub.com>



Wisdom

Mediation Capability

http://en.wikipedia.org/Great_Horned_Owl



<http://www.faringa.net>

... and – most important:

Honesty
(Ehrlichkeit)



<http://warrencampdesign.com>

(Professional) Competence:

Your professional advice must be (provably) correct and believable, as well as realistic

Behaviour:

Your behaviour must be truthful, fair and human in all situations

Praising and Reprimanding

<http://www.mindtools.com>



Praise:

- honest
- precise
- no „..., but ...“
- (can be) personal

„Your design of the module ABC is clear and elegant. I like it“



<http://footage.shutterstock.com>

Reprimand:

- true
- precise
- fair
- constructive
- never personal

„You did not take into consideration that a suitable data structure is already existing“

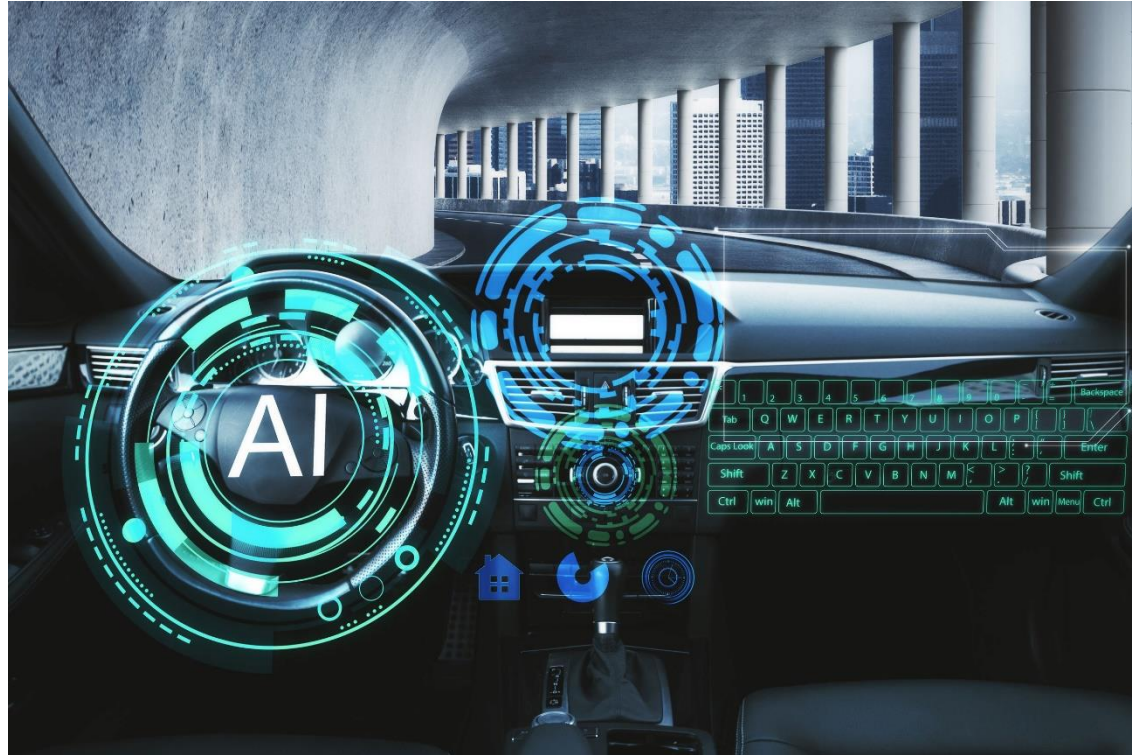
Software Engineering **Ethics**

ACM/IEEE: Software Engineering Code of Ethics and Professional Practice (© 1999)

1. PUBLIC - Software engineers shall act consistently with the public interest.
2. CLIENT AND EMPLOYER - Software engineers shall act in a manner that is in the best interests of their client and employer consistent with the public interest.
3. PRODUCT - Software engineers shall ensure that their products and related modifications meet the highest professional standards possible.
4. JUDGMENT - Software engineers shall maintain integrity and independence in their professional judgment.
5. MANAGEMENT - Software engineering managers and leaders shall subscribe to and promote an ethical approach to the management of software development and maintenance.
6. PROFESSION - Software engineers shall advance the integrity and reputation of the profession consistent with the public interest.
7. COLLEAGUES - Software engineers shall be fair to and supportive of their colleagues.
8. SELF - Software engineers shall participate in lifelong learning regarding the practice of their profession and shall promote an ethical approach to the practice of the profession.

<http://www.acm.org/about/se-code>





Content

Part 1

- Paper Drafts
- Peer Reviews

Part 2

- Presentations
- Feedback

Part 3

- Work Plan
- Next Steps

Part 4

- Final Words

- ✓ Soft Skills
- ✓ Personality
- ✓ **Burn-Out**

Burn-Out



An excessive ***mismatch*** of
Work ↔ Life balance
may lead to a **burnout**



Burnout

Emotional and physical ***exhaustion***
resulting from a combination of ***exposure***
to environmental and internal ***stressors***
and ***inadequate coping*** and lack of adaptive skills

<http://medical-dictionary.thefreedictionary.com/burnout>

... Burnout is an extremely serious medical condition!



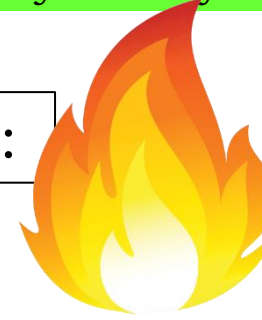
The Tell Tale Signs of Burnout

<https://www.psychologytoday.com/blog>

Signs of physical and emotional exhaustion:

- Chronic fatigue
- Insomnia
- Forgetfulness/impaired concentration and attention
- Physical symptoms (chest pain, heart palpitations, shortness of breath, gastrointestinal pain, dizziness, fainting, and/or headaches)
- Increased illness
- Loss of appetite
- Anxiety
- Depression
- Anger

... In your professional life you have two responsibilities:

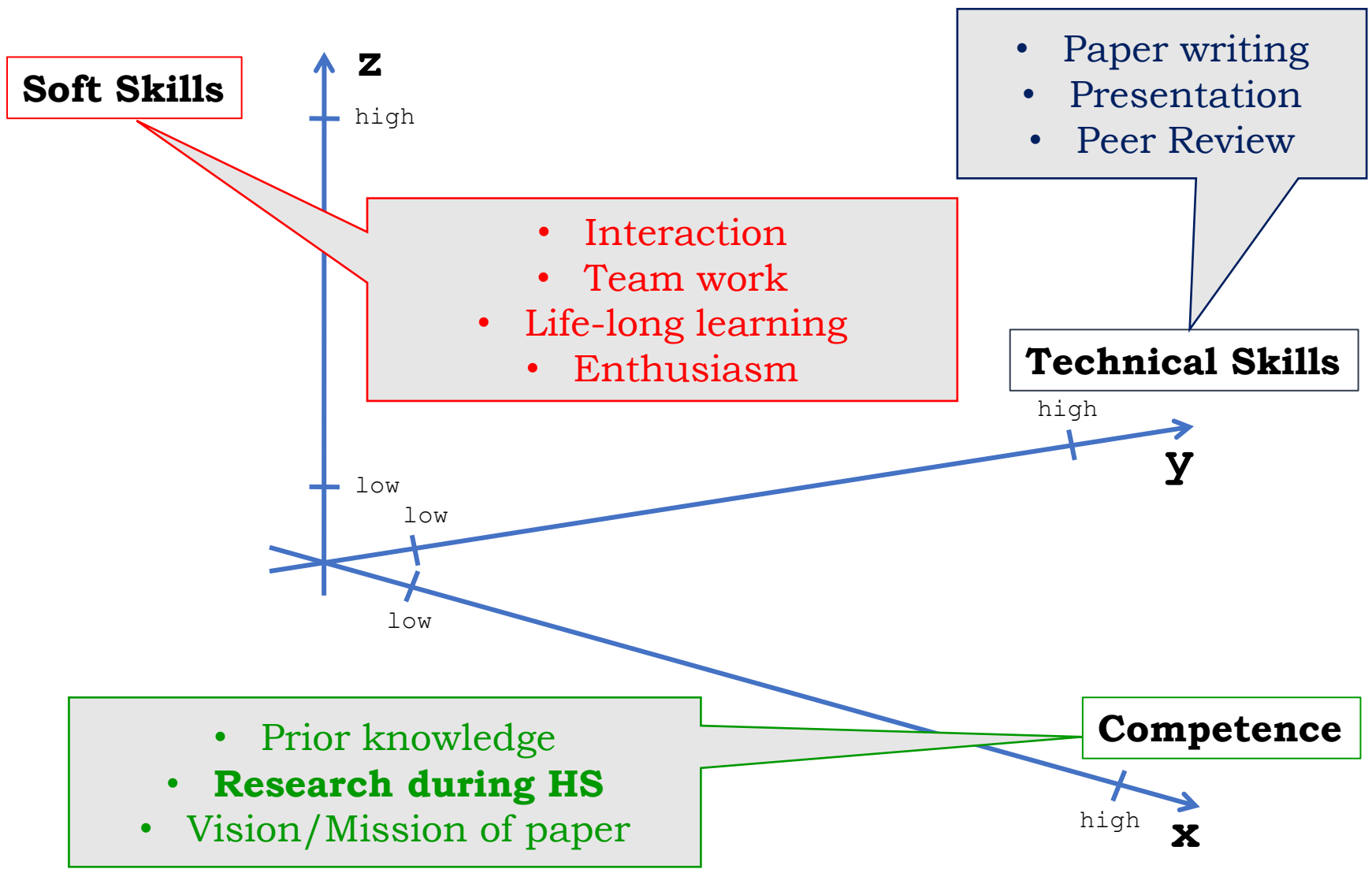


1) **Early recognition** of symptoms for burnout in **yourself**
⇒ get help (books, family, medical support, ...)

2) **Early recognition** of symptoms for burnout in **your colleagues**
⇒ give + search help



Skills improved in the Hauptseminar



After the delivery of the final paper (July 15, 2022):
... you have earned 3 ECTS Credits



<http://audioto.ru/best/ects-credits-system>

... you will also get a personal assessment and a grade for your work

The End

It was a pleasure to work with you

Hope to work with you again

All the best!

