

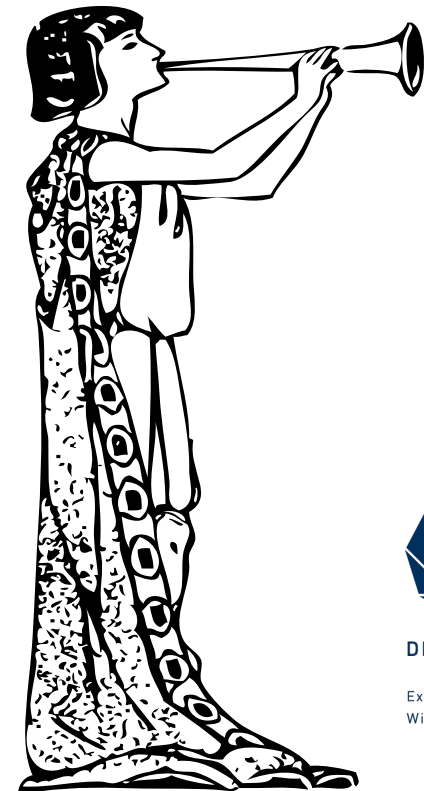
# Academic Skills in Computer Science (ASICS)

(Wissenschaftliches Arbeiten für Informatiker)

## 0. Announcements

Prof. Dr. Uwe Aßmann  
Softwaretechnologie  
Fakultät Informatik  
Technische Universität Dresden  
2016-0.2, 3/29/16  
<http://st.inf.tu-dresden.de/teaching/asics>

- 1) Outline
- 2) Literature



DRESDEN  
concept  
Exzellenz aus  
Wissenschaft  
und Kultur

# Contents

## Unit 1: Introduction

- ▶ 10) What is science?
- ▶ 11) Overview of the research process OI\*SDR
- ▶ 12) Basic Gathering of Information
- ▶ 13) Basic Problem Solving Techniques

## Unit II: Text processing with LaTeX

- ▶ Bibtex, Latex, Tikz, beamer, bibliographies

## Part III: Writing research papers

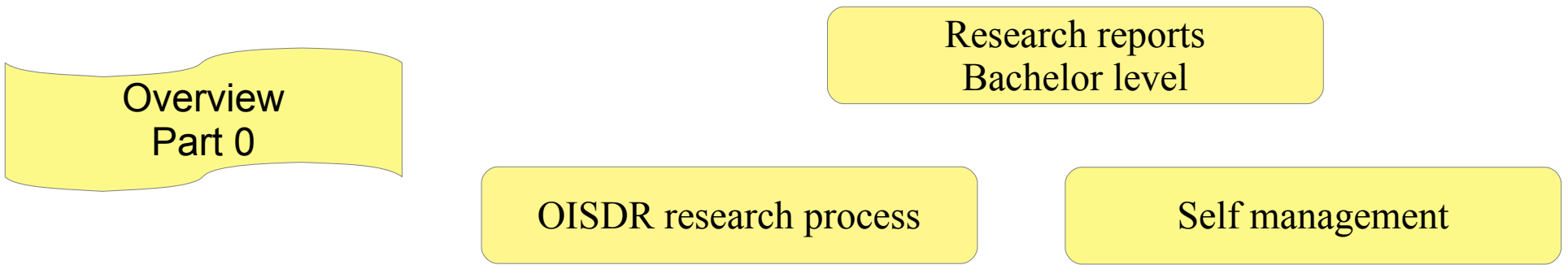
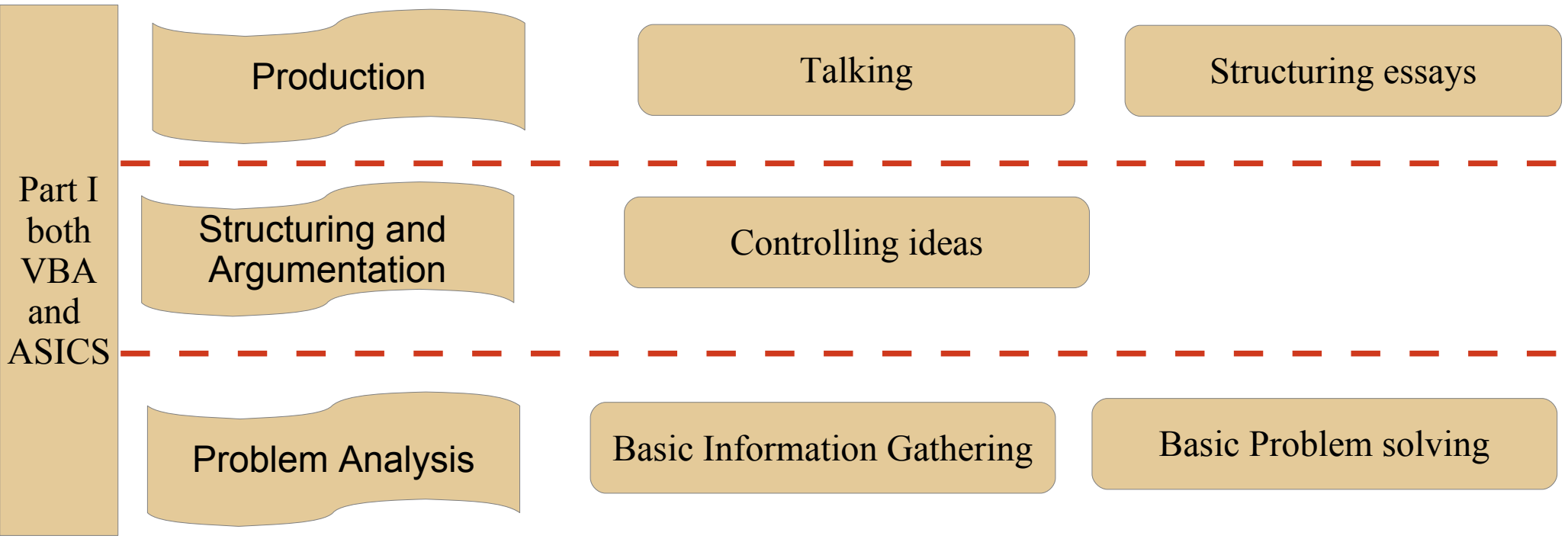
- ▶ 30) Writing a research paper I+II
- ▶ 32) Citations
- ▶ 33) Research in Software Engineering
- ▶ 34) Reviewing a research paper

- ▶ Part IV: Structuring Sentences, Paragraphs, and Essays
  - 40) Writing controlling ideas for unity and coherence
  - 41) Structuring essays
  - 42) Complex sentences
  - 43) Textification of bushes (fishbones and whalebones)
- ▶ Part V: Advanced Structuring
  - 50) Microthreading
  - 51) Development schemes for blocks and paragraphs
  - 52) Dialectic development schemes
  - 53) Simple argumentative schemes
  - 54) The Booth/Williams/Colomb/Toulmin model of argumentation
  - 55) Writing special parts (introductions, abstracts, etc.)

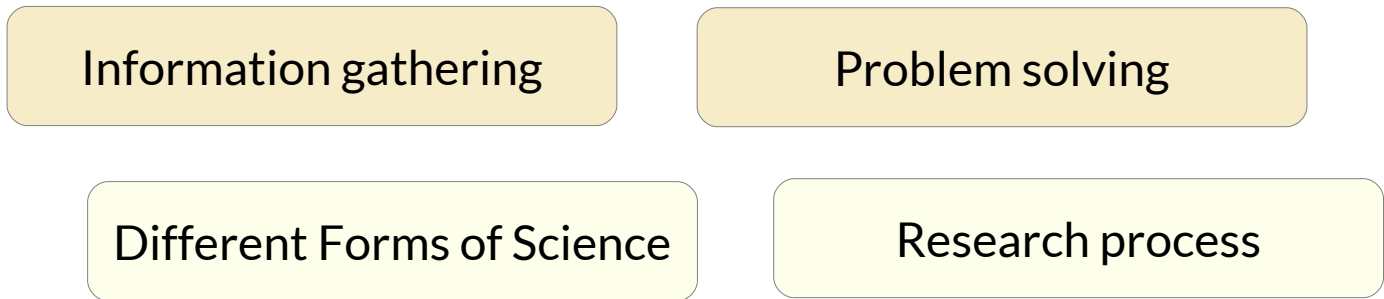
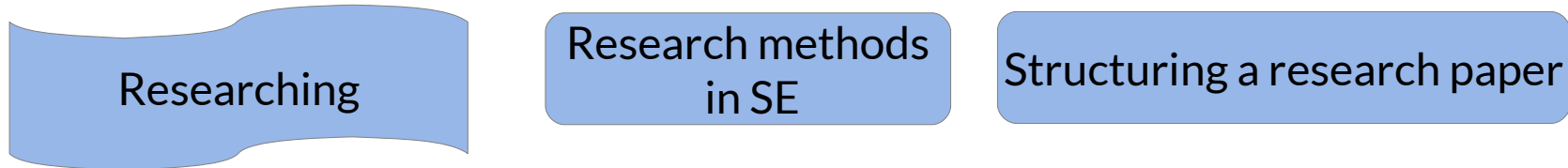
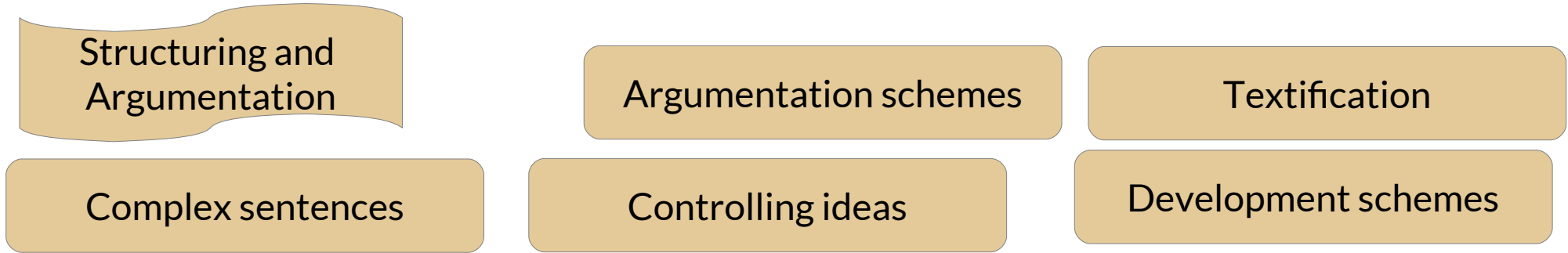
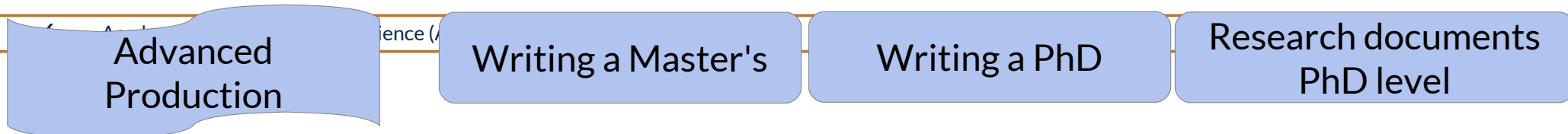
# Contents

- ▶ Unit VI: Talking and Collaborating
  - 60) Giving a research Talk I+II
  - 62) Configuration management with GIT
  - 63) Workshop organization
  - 64) Writing a research grant proposal
- ▶ Unit VII: The PhD Process
  - 70) Advanced Information Gathering
  - 71) Advanced problem solving techniques
  - 72) Writing a PhD thesis
  - 73) Different kinds of reports in the Master and PhD process
- ▶ Also: Summer term: Course VBA (year 3 of Bachelor)
  - Writing a Bachelor thesis
  - Self management

# Outline of the Bachelor-Level Course (VBA, summer)



# Outline of the Master and PhD-Level Course



# Knowledge and Science...

- ▶ Es gibt bekanntes Wissen. Das sind Sachen, von denen wir wissen, dass wir sie wissen.
- ▶ Es gibt bekanntes Unwissen. Das bedeutet, es gibt Sachen, von denen wir wissen, dass wir sie nicht wissen.
- ▶ Aber es gibt auch unbekanntes Nichtwissen. Das sind Sachen, von denen wir nicht wissen, dass wir sie nicht wissen.

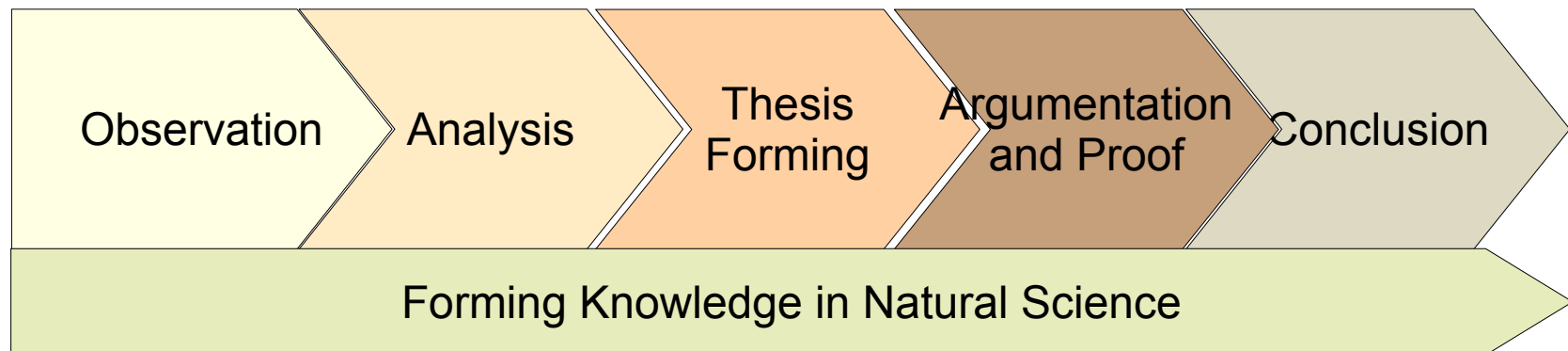
Donald Rumsfeld

[http://en.wikipedia.org/wiki/Known\\_and\\_Unknown:\\_A\\_Memoir](http://en.wikipedia.org/wiki/Known_and_Unknown:_A_Memoir)

- ▶ "Reports that say that something hasn't happened are always interesting to me, because, as we know, there are known knowns; there are things **we know that we know**.
- ▶ There are known unknowns. That is to say, there are things that **we now know we don't know**.
- ▶ But there are also unknown unknowns. There are things **we do not know we don't know**."
- ▶ Science is about objectively knowing - the known (knowledge) and the unknown (limits of knowledge).

# Rules of Deduction (Schlussregeln)

- ▶ Open World Assumption (OWA)
  - “alles, was ich nicht weiß, könnte wahr sein”
- ▶ Closed World Assumption (CWA)
  - “alles, was ich nicht weiß, ist falsch”
- ▶ Closed Domain Assumption (CDA)
  - “alles, was ich in diesem Kontext nicht weiß, ist in diesem Kontext falsch”





# Important Literature - Writing

- ▶ [Bünting] Karl-Dieter Bünting, Axel Bitterlich, Ulrike Pospiech. Schreiben im Studium. Ein Trainingsprogramm. Cornelsen-Scriptor. (Check out the edition of 1996)
- ▶ [Parks] A. Franklin Parks, James A. Levernier, Ida Masters Hollowell. Structured Paragraphs and Essays. Bedford/St. Martins. (A wonderful basic book about writing.)
- ▶ [Schaum] Molly McClain, Jacqueline D. Roth. Schaum's Quick Guide to Writing Great Essays. McGraw-Hill.
- ▶ [Pellegrino] Victor C. Pellegrino. A Writer's Guide to Powerful Paragraphs. Maui arThoughts Company, Hawaii.
- ▶ [Ross] Bruce Ross-Larson. Powerful Paragraphs. W. W. Norton.
- ▶ [WiCo] Joseph M. Williams, Gregory G. Colomb. Style – Toward Clarity and Grace. The University of Chicago Press.
- ▶ [Rotter/Bendl] Your Companion to English Texts. Comprehension Analysis Appreciation Production. Manz-Verlag, 1978
- ▶ [Brusaw] Charles T. Brusaw, Gerald J. Alred, and Walter E. Oliu. Handbook of Technical Writing. St. Martin's Press, New York, 1993.

# Other Literature

- ▶ [SGHM08] Dirk Siepmann, John D. Gallagher, Mike Hannay, and J. Lachlan Mackenzie. Writing in English: A Guide for Advanced Learners. Number 3124 in UTB. A. Francke, 2008.
- ▶ [Haeberlin] Dick Haeberlin. Connecting for Coherence. A Guide to Building Sentences with Syntax and Logic. Orange House Book, San Marcos, TX, 2008
- ▶ [Macgilchrist] Felicitas Macgilchrist. Academic Writing. Ferdinand Schöning. UTB 4087, 2014.
- ▶ Mike Markel. Technical Communication, free book. 10th Edition. Bedford St Martin's. [http://www.ebook3000.com/Technical-Communication--10th-Edition\\_173076.html](http://www.ebook3000.com/Technical-Communication--10th-Edition_173076.html)
- ▶ [Turner] Adam Turner. English Solutions for Engineering and Sciences Research Writing: A guide for English learners to publish in international journals. English Writing Lab Center for Teaching and Learning and College of Engineering, Hanyang University, Seoul, Korea
  - [www.hanyangowl.org](http://www.hanyangowl.org)

# Literature on Research Process

- ▶ [Krumbiegel] Helga Esselborn-Krumbiegel. Von der Idee zum Text. Eine Anleitung zum wissenschaftlichen Schreiben. 3. überarbeitete Auflage, 2008. UTB
- ▶ [BoCoWi] Wayne C. Booth, Gregory G. Colomb, Joseph M. Williams. The Craft of Research. The University of Chicago Press. Presents the Toulmin model of argumentation in a slightly modified form
- ▶ [Pöhm] Matthias Pöhm. Präsentieren Sie noch oder faszinieren Sie schon?: Abschied vom "Betreuten Lesen". Emotionale Rhetorik statt PowerPoint!

# Free Books on English Style

- ▶ [Abbott-Writing] Edwin A. Abbott. How to Write Clearly. Rules and Exercises on English Composition. <http://www.gutenberg.org/cache/epub/22600/pg22600.txt>
- ▶ [Devlin-Writing] Joseph Devlin. How To Speak And Write Correctly. Edited by Theodore Waters. The Christian Herald, New York, 1910. <http://www.gutenberg.org/ebooks/6409>
- ▶ Sherwin Cody. The Art Of Writing & Speaking The English Language Word-Study. The Old Greek Press, Chicago, 1903. Ebook #19719 <http://www.gutenberg.org/ebooks/19719>

# Literature - Argumentation

- ▶ [BWC] Wayne C. Booth, Joseph M. Williams, Gregory G. Colomb. The Craft of Research. The University of Chicago Press.
- ▶ [Thiele] Albert Thiele. Die Kunst zu überzeugen. Faire und unfaire Dialektik. Springer.
- ▶ [Leicher] R. Leicher. Verkaufen. TaschenGuide. Haufe-Verlag.
- ▶ [Scherer] Hermann Scherer. 40 Minuten für eine gezielte Fragetechnik. Gabal Verlag

# Literature: Writing Research Papers

- ▶ [Gonzalez] Fabio A. Gonzalez. Writing a Research Paper Depto. de Ing. de Sistemas e Industrial Universidad Nacional de Colombia, Bogota

# Literature: Science and Research

- ▶ [RomEnd] Albert Endres, Dieter Rombach. A Handbook of Software and Systems Engineering. Empirical Observations, Laws, and Theories. Pearson.
- ▶ [Töpfer] Klaus Töpfer. Erfolgreich Forschen. Springer. 2008. This is a book from Dresden (Wirtschaftswissenschaft) about empirical research in the Economics, mostly about empirical hypothesis design and evaluation.

# Excellent Writers Writing Books about Excellent Scientists

- ▶ English and German
- ▶ Dava Sobel. Longitude (Longitude). A wonderful book about John Harrison, the maker of the H-3, the first precise clock in the world
- ▶ [Sobel-Galileo] Dava Sobel. Gallileis Tochter. (Galileo's Daughter). Wonderful book about Galileo and the letters of his daughter. If you want to understand the inquisition..
- ▶ [Singh-Wiles] Simon Singh. Fermat's Last Theorem. Fourth Estate. Wonderful book about the mathematician Andrew Wiles, proving Fermat's last theorem in 7 years and 120 pages.
- ▶ Fermats letzter Satz. dtv.



# Excellent Writers – German Only

- ▶ [SchmEin] Helmut Schmidt. Einmischungen. Goldmann-Verlag. From Schmidt, you can read everything, and you learn a lot.
- ▶ [SchAD] Helmut Schmidt. Außer Dienst. Pantheon-Verlag.
- ▶ [SchW] Helmut Schmidt. Weggefährten. Pantheon-Verlag.
- ▶ [SchmidtMoral] Helmut Schmidt. Auf der Suche nach einer öffentlichen Moral. Deutschland vor dem neuen Jahrhundert. Goldmann.
- ▶ [SchKanz] Helmut Schmidt. Kanzlerjahre. Pantheon-Verlag.
- ▶ Schmidt's articles in the ZEIT are found online on [http://www.zeit.de/autoren/S/Helmut\\_Schmidt/index.xml](http://www.zeit.de/autoren/S/Helmut_Schmidt/index.xml)
- ▶ [ConteJalta] Arthur Conte. Die Teilung der Welt. Jalta 1945. dtv 1967
  
- ▶ Good German authors under <http://www.zeit.de/autoren/>
- ▶ <http://www.zeit-verlagsgruppe.de/presse/rechte-und-lizenzen/freie-nutzung/>

# Excellent Writers, German and English

- ▶ [Craig-Army] Gordon Craig. Die preußische Armee. Staat im Staate. Athenäum Droste Taschenbücher Geschichte 1980.
  - The Politics of the Prussian Army. Oxford University Press.
- ▶ [Craig-Germans] Gordon Craig. The Germans, Meridian.
  - Über die Deutschen. C.H.Beck-Verlag.
- ▶ [Craig-Germany] Germany 1866-1945. Oxford University Press.
  - Deutsche Geschichte 1866 - 1945: Vom Norddeutschen Bund bis zum Ende des Dritten Reiches. C.H.Beck
- ▶ Timothy Garton Ash, Historian and Journalist, writes excellent books about recent history, very often also translated from English to German
  - [http://en.wikipedia.org/wiki/Timothy\\_Garton\\_Ash](http://en.wikipedia.org/wiki/Timothy_Garton_Ash)
  - <http://www.timothygartonash.com/essays.html>

# Excellent English Examples from Gutenberg

- ▶ [Abbot-Airplanes] Willis J. Abbot. Aircraft and Submarines. The Story of the Invention, Development, and Present-Day Uses of War's Newest Weapons. 1918  
<http://www.gutenberg.org/cache/epub/30047/pg30047.txt>
- ▶ [Russell-Mysticism] Bertrand Russell. Mysticism and Logic and Other Essays  
<http://www.gutenberg.org/2/5/4/4/25447/>
- ▶ [Russell-Problems] Bertrand Russel. The Problems of Philosophy  
<http://www.gutenberg.org/cache/epub/5827/pg5827.txt>
- ▶ [Russell-Bolshevism] Bertrand Russell. The Practice and Theory of Bolshevism, 1920  
<http://www.gutenberg.org/1/7/3/5/17350/>
- ▶ [Zweig-Verhaeren] Stefan Zweig. Emile Verhaeren. Constable and Company Ltd, 1914  
<http://www.gutenberg.org/3/5/3/8/35387/>

# Excellent English (Public Domain)

- ▶ [Bush-Frontier] Science The Endless Frontier. A Report to the President by Vannevar Bush, Director of the Office of Scientific Research and Development, July 1945, United States Government Printing Office, Washington: 1945
  - <http://www.nsf.gov/od/lpa/nsf50/vbush1945.htm>
  - It is assumed that this is in the public domain because it is a US government publication

# Excellent German Examples from Gutenberg

- ▶ [Abbe] Ernst Abbe. Gesammelte Abhandlungen III. Vorträge, Reden und Schriften sozialpolitischen und verwandten Inhalts Editor: S. Czapski  
<http://www.gutenberg.org/files/19755/19755-0.txt>
- ▶ [Bernstein] Eduard Bernstein. Der Sozialismus einst und jetzt. Streitfragen des Sozialismus in Vergangenheit und Gegenwart  
<http://www.gutenberg.org/cache/epub/24523/pg24523.txt>
- ▶ [Rathenau] Walther Rathenau. Die Organisation der Rohstoffversorgung. Vortrag in der Deutschen Gesellschaft 1914, am 20. Dez. 1915. <http://www.gutenberg.org/files/21031/21031-0.txt>
- ▶ [Stresemann] Gustav Stresemann. Die Entwicklung des Berliner Flaschenbiergeschäfts. Inaugural-Dissertation, Universität Leipzig, 1900  
<http://www.gutenberg.org/cache/epub/33418/pg33418.txt>

# Other English References from Gutenberg

- ▶ [Abbot-Appeal] Francis Ellingwood Abbot. A Public Appeal for Redress to the Corporation and Overseers of Harvard University. Professor Royce's Libel. <http://www.gutenberg.org/cache/epub/19768/pg19768.txt>
- ▶ [Guedella] Philip Guedalla. Some Historians. In: Modern Essays. Editor: Christopher Morley. <http://www.gutenberg.org/3/8/2/8/38280/>
- ▶ [Schmucker-Lutherian-Churches] Beale M. Schmucker. The Organization of the Congregation in the Early Lutheran Churches in America. From the Lutheran Church Review, July, 1887. Philadelphia. <http://www.gutenberg.org/dirs/1/9/4/2/19422>
- ▶ [Sieveking] H. Sieveking, Moderne Probleme der Physik. TU Karlsruhe, 1913  
<http://www.gutenberg.org/files/38157/38157-pdf.pdf>
- ▶ [Stowe] Harriet Beecher Stowe, Onkel Tom's Hütte.  
<http://www.gutenberg.org/cache/epub/31459/pg31459.txt>
- ▶ [Treitschke] Heinrich von Treitschke: Die Gründung des Deutschen Zollvereins.  
<http://www.gutenberg.org/files/23065/23065-0.txt>
  - Achtung. Treitschke schreibt gut, aber er disqualifiziert sich durch seinen Antisemitismus  
[http://de.wikipedia.org/wiki/Heinrich\\_von\\_Treitschke](http://de.wikipedia.org/wiki/Heinrich_von_Treitschke)

# Other German References from Gutenberg

- ▶ [Assmuss] Eduard Assmuss. Parasiten der Honigbiene und die durch dieselben bedingten Krankheiten dieses Insects.  
<http://www.gutenberg.org/cache/epub/19673/pg19673.txt>
- ▶ [Sieveking] H. Sieveking, Moderne Probleme der Physik. TU Karlsruhe, 1913  
<http://www.gutenberg.org/files/38157/38157-pdf.pdf>
- ▶ [Treitschke] Heinrich von Treitschke: Die Gründung des Deutschen Zollvereins.  
<http://www.gutenberg.org/files/23065/23065-0.txt>
  - Achtung. Treitschke schreibt gut, aber er disqualifiziert sich durch seinen Antisemitismus  
[http://de.wikipedia.org/wiki/Heinrich\\_von\\_Treitschke](http://de.wikipedia.org/wiki/Heinrich_von_Treitschke)

# Excellent Examples from Free Ebook Portal of University of Adelaide

- ▶ [VannevarBush] Vannevar Bush. As We May Think. First published in The Atlantic Monthly, July 1945. This web edition published by [eBooks@Adelaide](#).  
<http://ebooks.adelaide.edu.au/b/bush/vannevar/as-we-may-think/>



# Examples from American Scholar

- ▶ [www.americanscholar.org](http://www.americanscholar.org) contains a lot of accessible essays about many different topics.

# The End