

Academic Skills in Computer Science (ASICS)

(Wissenschaftliches Arbeiten für Informatiker)

O. Announcements

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2013-0.2, 13-10-12

<http://st.inf.tu-dresden.de/acse>

- 1) Outline
- 2) Literature



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1



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

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Contents

3

- ▶ 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

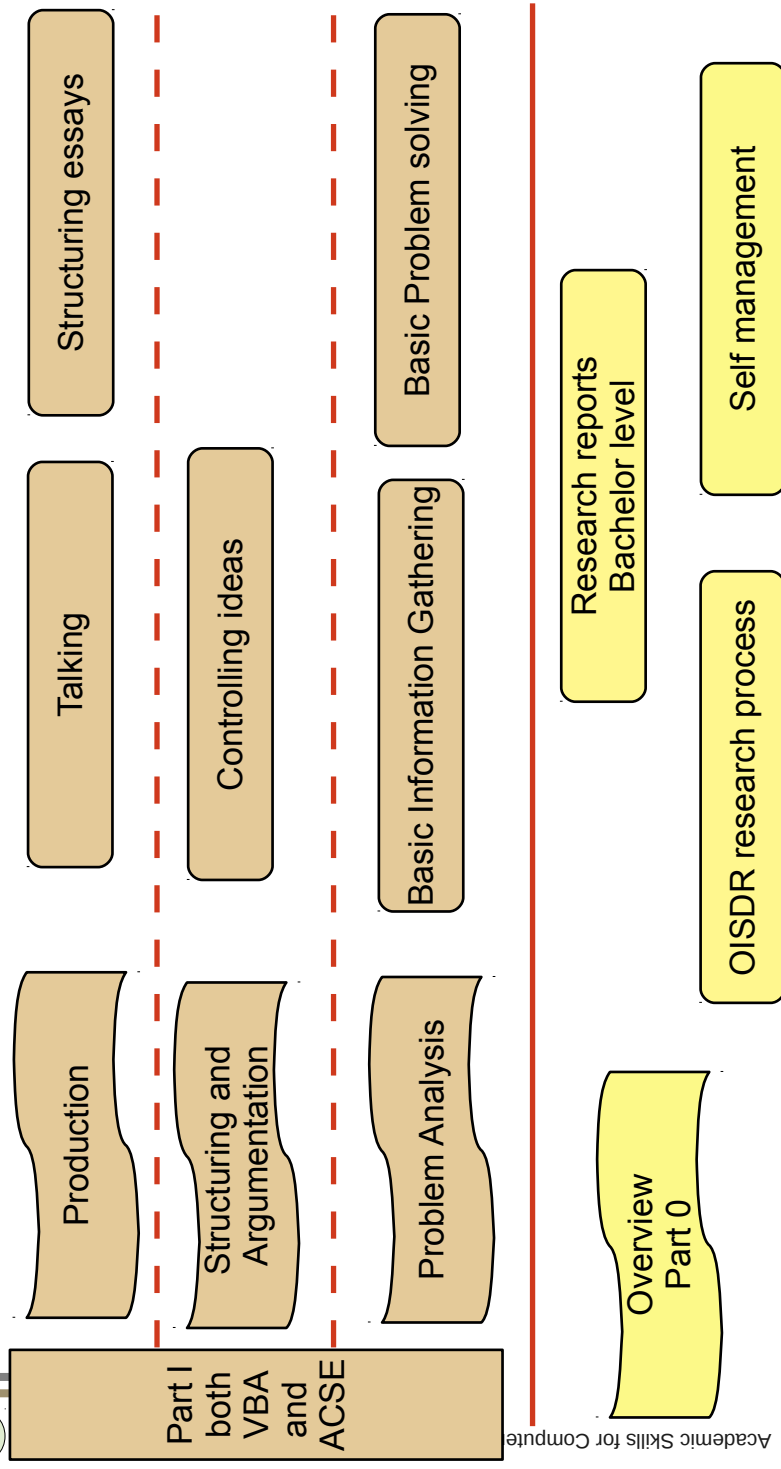
4

- ▶ 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)

5



Academic Skills for Computer Scientists



Knowledge and Science...

7

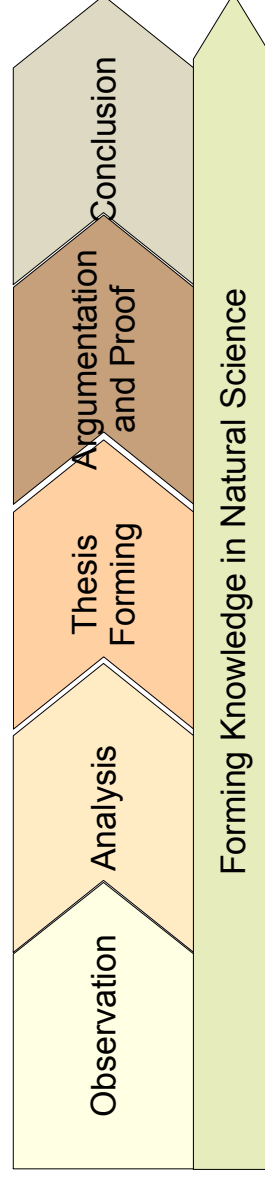
- ▶ Es gibt bekanntes Wissen. Das sind Sachen, von denen wir wissen, dass wir sie wissen.
 - ▶ Es gibt bekanntes Unwissen. Das bedeutet, es gibt Sachen, von denen wir wissen, dass wir sie nicht wissen.
 - ▶ Aber es gibt auch unbekanntes Nichtwissen. Das sind Sachen, von denen wir nicht wissen, dass wir sie nicht wissen.
- Donald Rumsfeld
- http://en.wikipedia.org/wiki/Known_and_Unknown:_A_Memoir
- ▶ "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."

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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.
- ▶ [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

10

- ▶ [SGHMO8] Dirk Siepman, John D. Gallagher, Mike Hannay, and J. Lachlan Mackenzie. Writing in English: A Guide for Advanced Learners. Number 3124 in UTB. A. Francke, 2008.
- ▶ Mike Markel. Technical Communication, free book. 10th Edition. Bedford St Martin's. 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



Literature on Research Process

11

- ▶ [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



Free Books on English Style

12

- ▶ [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

13

- ▶ [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

14

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

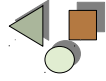


15

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.





16

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. Galileis 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.



17

Excellent Writers and Books about Excellent Scientists

- ▶ 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.
 - [ConteJalta] Arthur Conte. Die Teilung der Welt. Jalta 1945. dtv 1967
- ▶ English only
 -



Excellent Writers, German and English

18

- ▶ [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://www.timothygartonash.com/essays.html>



19

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/>



Excellent German Examples from Gutenberg

20

- ▶ [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

21

- ▶ [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





Other German References from Gutenberg

22

- ▶ [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



Excellent Examples from Free Ebook Portal of University of Adelaide

23

- ▶ [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/). <http://ebooks.adelaide.edu.au/b/bush/vannevar/as-we-may-think/>





Examples from American Scholar

24

- ▶ www.americanscholar.org contains a lot of accessible essays about many different topics.

