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DSP AI PhD survival guide

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MINISTRY OF EDUCATION,
YOUTH AND SPORTS

Approximate schedule

- 14:00-15:15 Tutorial incl. discussion
- 15:30-17:00 „Workshop“: sharing of experiences, suggestions for DSP organization, collaboration proposals, etc.

Topics to be (hopefully) covered

- General picture: where DSP AI thematically fits
- Official duties and milestones
- Informal hints
- DSP AI figures, community topics, etc.

- ***Note**: all in English, but I will try to align the English terms with the Czech ones (remind me if it is not the case!)*

Thesis topic clusters

- Mostly correspond to the topics of interest of the departments
  - KIT: Business/Data Analytics, IT Management, SW Development, …
  - KSA: IT Security/Audit, Social Informatics/Networks, …
  - KIZI: Data Mining, Semantic Web, Web Engineering, …
  - KME: Multimedia Communication, …
- In FORD categories,[1] ranged under:
  - 1. Natural Sciences - 1.2 *Computer and information sciences*
  - 5. Social Sciences - 5.2 *Economics and Business*
  - 5. Social Sciences - 5.8 *Media and communications*
  - sometimes also other, e.g., health sciences…

[1] http://www.oecd.org/sti/inno/Frascati-Manual.htm

Vs. ACM Computing Curricula etc.

- Cf. https://www.acm.org/education/curricula-recommendations
- Some (applied) *Computer Science*
  - Technological topics, such as data mining or semantic web
- Most often *Information Systems* (IS)
  - Sometimes mixed with *Software Engineering*
  - Sometimes mixed with *Information Technology* (IT)
    - Going from business through people to technology, wrapped for specific cases
- Occasionally also: (*Library and*) *Information Science*, or *Media Studies*
- In Europe, esp. German-speaking: IT+IS=BISE, *Business Information & System Engineering*, see e.g. the journal: http://www.bise-journal.com/

Challenges in BISE research

- By Leitmeister et al.:[1]
  - Relevance Versus Rigor
  - Company- Versus University-Based
  - Interdisciplinary Versus Disciplinary

[1] J. M. Leimeister et al.: Doing a Doctorate in BISE in Germany, Austria and Switzerland?, Bus Inf Syst Eng 61(6):759–766 (2019) …*credits to Michal Doležel for pointing me to it*

DSP AI: relevance (and some rigor)

- Traditionally, DSP AI more biased towards relevance than towards rigor
  - Most PhDs have part- or full-time jobs in industry
- While the relevance *is* our asset, we ought to (slightly) pressure on *rigor*, too… industrial relevance *alone* is not enough for a PhD
  - Even a lightweight but coherent methodological grounding helps lift the publications to good journals or conferences
  - Situation in BISE, Western Europe: „The necessary theoretical rigor is a prerequisite for earning the doctorate degree. It is taught throughout the PhD program and indirectly enforced through the publication system of our top conferences and journals.“ (Leitmeister et al.)
    … this will be enforced to us from outside, sooner or later

DSP AI: lagging behind corporates?

- To some degree holds both for technological fields and business-oriented fields (e.g.,)
  - SotA tools for well-defined tasks, e.g., data mining or NLP, now often developed by research units of big companies; partly via acquiring tech startups
  - ‘Soft artifacts’ such as IT governance frameworks constantly evolving by effort of professional associations
- Attempts to cooperate with corporate research units and startups – partial success
  - Model of ‘joint doctorate’ – yet to be refined and tested

DSP AI: interdisciplinarity

- Networking of students working on different topics highly encouraged
  - Role of IGA projects, meetups, etc.
  - Even across departments
- Faculty-wide interdisciplinarity
  - Program of pairing the AI and “statistics” PhDs

Official milestones

- Nowadays nearly all listed as ‘subjects’ in INSIS
  - Project defense – end of Y1
  - Partial exams – two (at least) in Y1, all in Y2
    - Possibility to *choose the subjects*… but not completely freely, check the accreditation doc
  - State doctoral exam (SDE) – end of Y3 at the latest
    - Discussion on two *chosen topic areas* + on the *thesis* project
  - ‘Small’ defense – end of Y4 (at the latest)
    - Organized within the ‘home’ department
    - Usually one reviewer
  - (Final) defense
    - 2-3 reviewers, mostly from outside FIS

Exam/defense caveats

- Exams: usually not very hard, but take some time
  - The examiners mostly expect you to *read* some literature and give a presentation and/or *write* an essay/paper
- Small defense: the thesis should be complete (aside very minor corrections/gaps)

Associated publication requirements

- In order to apply for:
  - State Doctoral Exam
  - Final Defense
- The fulfilment of the requirements is neither easy nor simple to gauge!
  - See comments later

Other formal requirements (1)

- Presentation at „Den doktorandů“ (ako contest)
  - Once within the first 3 years
- Presentation before the DSP Advisory Board („oborová rada“)
  - 3rd semester
  - Ako follow-up to the project defense – not about passing or failing, but about collecting feedback, mainly from experts outside VŠE

Other formal requirements (2)

- International collaboration
  - Longer-term internship (preferred)
  - OR Participation in an international project
  - OR Direct bi-lateral collaboration, typically witnessed by joint paper/s
  - OR Another kind of direct collaboration (?)
- The partner should be a university, research institute, or possibly a corporate research unit

Requirements - „technicalities“

- Preparation of the Individual Study Plan (ISP)
  - Beginning of the study – usually September
  - By the advisor, jointly with you (usually F2F)
  - Plan for exams, but also (informally) publications, internships, etc.
- Preparation of the topic description („zadání“) in INSIS
  - End of the first semester – similar as for Bc or Mgr
  - By the advisor… but needs input from you
- Preparation of the annual Study report („Zpráva o průběhu…“)
  - End of every academic year
  - By the advisor… but needs input from you

Publication requirements: caveats

- Completely different schemes (but also subtle deviations) valid for *different entrance years* of students
- Evaluation of PhD student publication now coupled with the methodology of evaluating the *research at the FIS departments* as such
- The recognition of publication depends on the *indexing* of journals/conferences in citation DBs

Scheme for entrance until 2016 (incl.)

- Only 9 students by now
- For the SDE
  - 1 peer-reviewed publication of any kind
- For the defense - alternatives
  - 2 peer-reviewed journal article + 1 conference paper presented in English
  - 3 peer-reviewed journal articles
  - 1 article/paper indexed in WoS + 1 conference paper presented in English

Scheme for entrance in 2017 or later

- 2 combined types of requirements
  - Some amount of points according to the FIS research evaluation methodology (“Zásady hodnocení publikační činnosti…”) – the version valid in the entrance year
    - https://fis.vse.cz/tvurci-cinnost/informace/publikacni-cinnost-fis/ (unsure if an English version exists…)
  - *For the defense admission only:* 1 article in a journal indexed in WoS or Scopus; the PhD student’s share on it must be at least 1/3
    - The points for this article do count for the first requirement, too

Heuristics for the new system

- When you have the (WoS/Scopus) journal article, the points are no longer a problem
- Getting the points for the SDE is tough, as few students already have a journal article accepted; usual workarounds:
  - Thematic workshops affiliated to major conferences (proceedings published in the CEUR-WS.org – usually indexed by Scopus)
  - PhD workshops affiliated to major conferences (proceedings published in the CEUR-WS.org – usually indexed by Scopus)
  - Local (WoS/Scopus-indexed) conferences, e.g., https://idimt.org/, some other Czech universities also organize one
  - Most recently: FIS also has its Scopus-indexed informatics journal: https://aip.vse.cz/
- E.g., 3x 50% authorship of an (indexed) conference paper roughly suffices for applying for the SDE
- Ask the advisors (they should know the rules – these apply to them, too), but double-check, and also feel free to ask me!

Beyond the pragmatic heuristics

- Risk of prematurely changing your research outcome to ‘small coins’
  - If you publish your material piecewise in local venues (even if indexed), there might not remain enough for a major (usually, journal) article
  - (However, it of course make sense to submit your *very first* paper to a *less demanding* venue, just to learn the basic paper writing craft and get acquainted with the review proces procedure.)
- Recommended „bold“ strategy for those who think that their idea has a *strong potential*:
  - Submit to a good journal (say, Q2+) in the 2nd year at the latest
  - You typically get a „reject“… and, excellent (though rather critical) feedback
  - Based on the reaction, consider whether to
    - Keep revising and resubmitting to this or another good journal
    - Reducing the ambitions, going to a less prestigious journal (say, Q3), most likely succeeding thanks to the feedback obtained from the good journal
- Note: Q1… Q4 refers to the quartile ranges of journals in the biblio database ranking, e.g., Q1 contains the best ¼ of journals in the ranking
  - The metrics used for the ranking are typically AIS or IF (impact factor) for WoS, and SJR for Scopus

Concerns related to publishers

- Beware the *predatory* publishers
  - Some list false „impact factors“
  - Some may even be truly Scopus-indexed
  - Not always easy to tell apart from solid publishers… but publishing there may give rise to doubts about the quality of your research
  - Check portals such as https://beallslist.net/
- Be aware of the *length* of the publishing process in journals
  - A common pattern may be: 1st submission in late Y2, revision/resubmission in Y3, acceptance in Y4, published after the defense
- Be aware of the *article processing charges* (APC) in Open Access (OA) journals
  - Can be covered from grant projects
  - However, the project is usually over when the publication eventually comes out!
  - FIS policy on such cases is yet to be set up?
- Depending on the quality of your English, papers to most good journals might have to undergo a copy-editing proces
  - Also can be covered from grant projects

Co-authorship

- A tough issue in general…
- Historically, a PhD student had been expected to have at least some publications as the *sole* author, but nowadays it is not the case
- It is advisable to have *some* joint publication with the *advisor*, however, it is not mandatory to include the advisor as co-author to *every* publication; thus a suggestion:
  - Of course, the advisor should be co-author of all publications where his/her contribution is *significant*
  - For the publications where the advisor only contributed by an *occasional feedback*, pick one where this feedback is most extensive or important (even the feedback effort cumulatively represents a decent amount of the advisor's working time…)
- In Applied Informatics, the *order* of the authors matters
  - …even if some authorities claim the opposite

More technicalities

- If you are supported by a grant or similar resource, check if/how the *acknowledgment* to it is to be included in the paper before it is published
- Don't forget to *register* your publications in the VŠE database, http://pcvse.vse.cz/ once they come out
  - At some departments (at least, KIT): hand them to the secretary
  - At others: usually the advisor will help you
  - Do not forget to associate the publication with the grants there, too
  - In PCVSE you can also find the *quartile ranges*, for any journal, with respect to the different FORD categories

Top-on funding options

- Most widespread instrument: IGA projects
  - For *teams* typically led by a PhD student (or led by a teacher, but containing PhD students)
  - Now to be augmented with IGA/A – „elite“ projects with more stress on international excellence (support by the current ESIF grant)
- POKR: Program of Personal and Qualification Growth
  - For individuals; funding based on *commitment* to journal publications (Q3+)
- *Posterior* stipends for published articles
- Doktorand 4.0: individual elite program for true *full-time* students
  - Decent funding, but requires commitment to articles in Q2+ journals
- Various *external grant projects* by the advisors or other members of departments
  - GAČR, TAČR, MŠMT, other ministries, etc.
- *Dedicated* support of interships, summer schools, etc., see a catalog:
  - https://veda.vse.cz/podpora-vedy/katalog-podpor/katalog-podpor-2020/

DSP AI: basic facts

- 27 students + 8 accepted candidates = 35
- Of these, 4 in the English branch
- 15 active advisors
  - + 2 standalone, with vacancies
- About 6-7 consultants (some not yet official)
- DSP internally accredited till 2029

DSP AI community

- Meetups
  - AIPM (Spring/Summer)
  - AINA (Autumn)
    - … slides from the 2019 edition now also made available on the intranet, sorry for the delay
  - Den doktorandů („Day of doctoral students“, February): faculty-wide
- https://www.linkedin.com/groups/8437660
  - now rather sleeping, feel free to share your news/findings

Questions / comments?