

“Your Future Doctor May not be Human” Syllabus

Developed by Prof. Sally Wyatt and Dr. Flora Lysen for Maastricht University



Course Description:

The rapid development of artificial intelligence (AI) is considered one of the most transformative forces of our time. In this seminar, we will focus on one specific domain that is rapidly changing due to emerging AI applications: image-based medicine. In the past years, automated image recognition technology has become much better at analysing medical images such as x-rays, CT-scans and MRIs. These techniques are now introduced in hospitals and increasingly used by medical imaging experts, including pathologists and radiologists working in the Netherlands. In 2018, newspaper headlines expressed the excitement around this new development: “AI system beats team of 15 doctors in competition” (Walter 2018) and “Your future doctor may not be human” (Norman 2018). Yet in 2020, an increasing number of scholars also wonder if the hype around AI has exaggerated the benefits of what is variously called “algorithmic care,” “deep medicine” or “digital medicine.”

In this seminar, we will carefully analyse the social and ethical issues related to this very current debate and we will examine the way potential threats, promises and hopes around medical AI are framed. Examples of questions that students will be addressed in this seminar are:

- How do medical professionals react to technologies that promise/threaten to take over part of their work?
- How do the “intuitive skills” and expertise of the medical imaging professional relate to the trained image recognition of a machine?
- What does “bias” mean when both humans and machines are accused of suffering from bias?
- Who is responsible when an AI-assisted diagnosis is lacking, and what does responsibility mean in this situation?
- Do medical professionals need to understand how automated image recognition works?
- Do patients need to know about the role of AI in their medical treatment?

Students in this seminar will engage with such questions by reading and discussing relevant medical AI literature in relation to scholarship from science and technology studies, medical anthropology, digital sociology, cultural and historical studies of science and responsible innovation studies. You will be encouraged to become critically aware of the way issues around medical AI are framed in public and academic debates and to ask why some questions become foregrounded over others. The final assignment of this seminar is a paper of +- 4000 words (excluding references). As part of the honours seminar, students will also interview a medical professional, a health tech developer or a policy advisor to improve their qualitative research skills.

This seminar is related to a recently started research project about AI in clinical decision making, involving both Flora and Sally, and other colleagues from Utrecht and Radboud.

Session 1: Introducing AI & Health



Readings:

Thomas, R. (2020, October 19). Medicine's machine learning problem. *Boston Review*. <https://www.bostonreview.net/articles/rachel-thomas-medicines-machine-learning-problem/>

Robbins, R. & Brodwin, E. (2020, July 15). Patients aren't being told about the AI systems advising their care. *STAT* (blog). <https://www.statnews.com/2020/07/15/artificial-intelligence-patient-consent-hospitals/>

Videos:

Topol, E. (2019, May 19). How AI will liberate doctors from keyboards and basements. *Big Think*. <https://bigthink.com/health/ai-2637549115/>

Session 2: Exploring AI & Health



Readings:

- Kind, C. (2020, August 23). The term 'Ethical AI' is finally starting to mean something. *VentureBeat* (blog). <https://venturebeat.com/ai/the-term-ethical-ai-is-finally-starting-to-mean-something/>
- Marcus, G., & Little, M.A. (2019, October 23). Advancing AI in health care: It's all about trust. *STAT* (blog). <https://www.statnews.com/2019/10/23/advancing-ai-health-care-trust/>

Student presentations:

Students should select one of the following readings and prepare a brief presentation to be given during class.

- Luxton, D. D. (2019). Should Watson be consulted for a second opinion? *AMA Journal of Ethics*, 21(2), 131-137. <https://doi.org/10.1001/amajethics.2019.131> (an interesting case study on the use of an AI and lays out in detail its inherent limitations)
- The Decision Lab. (n.d.). *Why do our decisions depend on how options are presented to us?* <https://thedecisionlab.com/biases/framing-effect> (introducing the Framing Effect)
- Niethammer, C. (2020, February 3). AI bias could put women's lives at risk. A challenge for regulators. *Forbes*. <https://www.forbes.com/sites/carmenniethammer/2020/03/02/ai-bias-could-put-womens-lives-at-risk-a-challenge-for-regulators/?sh=16dd4e6b534f>

Session 3: Presentation by Dr. Rianne Fijten on the PROSPECT clinical decision-making tool // Examining AI & the Global South

Readings:

- Adams, R. (2021). Can Artificial Intelligence Be Decolonized? *Interdisciplinary Science Reviews*, 46(1-2), 176-197. <https://doi.org/10.1080/03080188.2020.1840225>
- Johnson, K. (2021, March 7). Building AI for the Global South. VentureBeat (blog). <https://venturebeat.com/2021/03/07/building-ai-for-the-global-south/> (This article contains many links to other relevant literature and initiatives)
- Lô, G., Boer, V. D., & Schlobach, S. (2017). Linking African Traditional Medicine Knowledge. In *Proceedings of the 10th International Conference on Semantic Web Applications and Tools for Health Care and Life Sciences (SWAT4LS 2017), Rome, Italy, December 4-7, 2017*. <http://ceur-ws.org/Vol-2042/paper32.pdf>
- Sigh, R. (2021, January 26). *Mapping AI and the Global South*. Points: Data and Society. <https://points.datasociety.net/ai-in-the-global-south-sites-and-vocabularies-e3b67d631508> (This article contains many links to other relevant literature and initiatives)

Videos:

- Glabau, D. (2021, January 26). *AI Ethics Course: AI for whom?* by Danya Glabau [Video]. Youtube. <https://www.youtube.com/watch?v=McFhb4TmnA0>

Danya Glabau draws on a chapter on AI and health (situated in the U.S.) by Virginia Eubanks in her book: Eubanks, V. (2018). *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. St. Martin's Publishing Group.

Student presentations:

Students should select one of the following readings and prepare a brief presentation to be given during class.

- Wahl, B., Cossy-Gantner, A., Germann, S., & Schwalbe, N. R. (2018). Artificial intelligence (AI) and global health: how can AI contribute to health in resource-poor settings? *BMJ Global Health*, 3(4), 1-7. <http://orcid.org/0000-0002-0037-7364>
- Arun, C. (2019). AI and the Global South: Designing for Other Worlds. Forthcoming in M. D. Dubber, F. Pasquale, and S. Das (Eds.), *The Oxford Handbook of Ethics of AI*. Oxford University Press, Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3403010

Skills: "Writing Vignettes: One Way of Presenting the Results of Qualitative Research" by Prof. Sally Wyatt

Vignettes are illustrations with words. They can describe a hypothetical person, event, situation, or future scenario, and can be helpful in stimulating thought and discussion. They are often used in social work, psychology and health care teaching and research as they can help practitioners reflect on dilemmas or sensitive issues that might come up in their clinical practice. They can also be used as prompts in focus groups or with research respondents who might have limited knowledge of a topic or where people might feel inhibited sharing their own experiences. For example, a researcher can prepare a vignette about the use of dating apps without having to ask respondents to reveal too much about their own experiences. Discussion sparked by the vignette could, nonetheless, provide insight into how the respondents think and feel about dating apps. That can serve as a concrete basis for discussion, shared by all participants and the researcher.

Vignettes are also sometimes used to represent the results of research, especially in ethnography. Instead of providing tables with the numbers of responses to different questions, perhaps illustrated with quotations, the author prepares a vignette which illustrates the main themes emerging from her/his research. This can be a way of leading the reader into the longer analysis (with tables and quotations).

A vignette can be a composite, drawing on elements from different situations (multiple interviewees, focus groups or observations). In other words, you can present it as about a single person even though you are combining features or comments from different people. But the vignette must remain 'true' to the material.

Think about the following questions:

- What are the characteristics of a good vignette?
- How does a vignette differ from other kinds of writing?
- What are some of the ethical challenges of writing vignettes (e.g. protecting privacy of respondents vs. 'making stuff up') and how could they be addressed?

You can find interesting examples of vignettes in:

Oudshoorn, N. (2020). *Resilient cyborgs. Living and dying with pacemakers and defibrillators*. Palgrave Macmillan, pp.3-4

Wyatt, S., Henwood, F., Hart, A., & Smith, J. (2005). The digital divide, health information and everyday life. *New Media and Society*, 7(2), 199-218. <https://doi.org/10.1177/1461444805050747>

Harris, A., Wyatt, S., & Kelly, S. (2013). The gift of spit (and the obligation to return it). How consumers of online genetic testing participate in research. *Information, Communication & Society*, 16(2), 236-257. <https://doi.org/10.1080/1369118X.2012.701656>

Online resource:

AnthroWrites. (n.d.). *Writing the moment*. <https://www.anthrowrites.com/moment>

Further reading:

Elliot, D., & Culhane, D. (Eds.). (2017). *A different kind of ethnography. Imaginative practices and creative methodologies*. University of Toronto Press.

O'Reilly, K. (2005). *Ethnographic methods*. Routledge.

Prentice, R. (2013). *Bodies in formation: An ethnography of surgery and anatomy education*. Duke University Press.

Stewart, K. (2007). *Ordinary affects*. Duke University Press.

Session 4: Presentation by Jojanneke Drogdt on interviewing pathologists about AI // 5-minute presentations with first ideas on how to analyse PROSPECT



For this session students will give 5-minute presentations of first ideas on how to investigate the "PROSPECT" tool of Maastricht clinic. Here are links to interesting resources that may give some background to this case study.

Readings:

Nielsen, K. D., & Langstrup, H. (2018). Tactics of Material Participation: How Patients Shape Their Engagement through e-Health. *Social Studies of Science*, 48(2), 259–82.

<https://doi.org/10.1177/0306312718769156>

Prainsack, B. (2018). The 'We' in the 'Me': Solidarity and Health Care in the Era of Personalized Medicine. *Science, Technology, & Human Values*, 43(1), 21–44.

<https://doi.org/10.1177/0162243917736139>

Videos:

Carlsson, S. V. (2019, January). *Shared Decision Making for Prostate Cancer Decisions: When the Patient has a Laundry List and the Doctor has 8 Minutes* [Video]. Grand Rounds in Urology.

<https://grandroundsinurology.com/shared-decision-making-for-prostate-cancer/>

A striking framing of the discussion in the Wall Street Journal (mentioned in the video above):

Lagnado, L. (2017, September 2). Bargaining With Cancer Patients About Treatment. *Wall Street Journal*. <https://www.wsj.com/articles/bargaining-with-cancer-patients-about-treatment-1504350001>

Session 5: Vignette writing in qualitative research

Prior to the session, students should work on the following:

- continuing efforts to find out more about PROSPECT and related systems;
- identify stakeholders to interview, and start drafting questions to ask
- experimenting with writing a vignette

Drafts of the vignettes must be handed in prior to class. During session five, students will be asked to present the stakeholder they have identified and the questions they would like to ask them. We hope that students will be in touch with each other to share resources and to make sure there won't be too much overlapping work. Of course, if preferred, joint presentations will also be possible.

Skills: Tips for perspectives in writing about health and medicine by Dr. Megan Milota

Introductionary reading:

Niederhoff, B. (2011). Perspective – Point of View. In Peter Hühn et al. (Eds.), *The Living Handbook of Narratology*. Hamburg University. <https://www.lhn.uni-hamburg.de/node/26.html> (bit long-winded but is worth skimming)

The impact of perspective in writing according to empirical studies of literature:

Salem, S., Weskott, T., & Holler, A. (2017). Does narrative perspective influence readers' perspective-taking? An empirical study on free indirect discourse, psycho-narration and first-person narration. *Glossa: A Journal of General Linguistics*, 2(1), 1-18. <https://doi.org/10.5334/gjgl.225>

For further reading on the topic have a look at the work of Jemeljan Hakemulder, who has published extensively on this topic.

Biomedical perspectives:

Zwakman, M., Milota, M. M., van der Heide, A., Jabbarian, L. J., Korfage, I. J., Rietjens, J. A. C., van Delden, J. J. M., & Kars, M. C. (2021). Unraveling patients' readiness in advance care planning conversations: a qualitative study as part of the ACTION Study. *Support Care Cancer*, 29, 2917-2929. <https://doi.org/10.1007/s00520-020-05799-x> (on first to third-person perspective shifts in conversations about end-of-life care)

Perspectives of a technology / object:

Adams, C., & Thompson, T. L. (2016). *Researching a Posthuman World: Interviews with Digital Objects*. Palgrave Macmillan.

Latour, B. (1996). *Aramis, or the love of technology*. Harvard University Press. (Example of writing from this perspective)

Session 6: Discussing interview questions



Skills: Guidelines for qualitative interviews

Strategies for Qualitative Interviews. (n.d.). Harvard Department of Sociology.

https://sociology.fas.harvard.edu/files/sociology/files/interview_strategies.pdf

Prior to the next session, students should work on the following:

- Reflecting on sensitive issues in interviewing

Readings:

Bernard, H. R. (2011). *Research methods in anthropology: Qualitative and quantitative approaches* (5th ed.). Walnut Creek, CA: AltaMira Press.

(Read chapter 8 “interviewing I: structured and unstructured” (pp.156 -186) . Sensitive issues are somehow weaved into the story of the whole chapter. On page 181-182 there is a short section about threatening questions.)

Lune, H., & Berg, B. L. (2017). *Qualitative research methods for the social sciences*. Pearson.

(Read chapter 4 “a dramaturgical look at interviewing” (pp.65-93) is meaningful in how to design/set up the questioning order with sensitive questions. This is explained in detail on pages 71-75, in section 4.5.)

Brayda, W. C., & Boyce, T. D. (2014). So you really want to interview me?: Navigating “sensitive” qualitative research interviewing. *International Journal of Qualitative Methods*, 13(1), 318-334. <https://doi.org/10.1177/160940691401300115>

Please scan these texts and contemplate their importance relation to the upcoming (potential) patient interview.

- Background to decision support systems (esp. patient decision aids regarding treatment)

Current state of the field:

Researchers in the Maastricht-based D-lab (an AI lab focussing on Decision Support Systems) concluded in 2019 that there is not much scientific research into this field yet:

"The development of patient decision aids is a new field of research, and few successes have been made for PCa [prostate cancer] patients. Though the idea of informed decision-making by patients is in line with the goal of personalized medicine, the development of these tools needs to overcome a number of barriers to be successful, like comprehensiveness, language barriers, patient cooperation, and physician cooperation. More research needs to be performed to better empower clinical decisions in the diagnosis and treatment process."

(van Wijk, Y., Halilaj, I., van Limbergen, E., Walsh, S., Lutgens, L., Lambin, P., & Vanneste, B. G. L. (2019). Decision support systems in prostate cancer treatment: an overview. *BioMed Research International*, 1-10. <https://doi.org/10.1155/2019/4961768>)

Readings:

Please scan the following relevant article mentioned by van Wijk et al. and take note how these may be relevant for the upcoming interviews and vignette writing practices.

Berry, D. L., Wang, Q., Halpenny, B., & Hong, F. (2012). Decision preparation, satisfaction and regret in a multi-center sample of men with newly diagnosed localized prostate cancer. *Patient Education and Counseling*, 88(2), 262-267. <https://doi.org/10.1016/j.pec.2012.04.002>

It is also suggested to read the prologue (pp. 1-4) of the subsequent book. Writing in 2007, Mol opens up questions about (a new societal focus on) "patient choice". Extra reading would be chapter 1 of this book, where she analyses a logic of choice vs. a logic of care.

Mol, A. (2011). *The Logic of Care: Health and the Problem of Patient Choice*. Routledge.

- Learning more about vignette writing

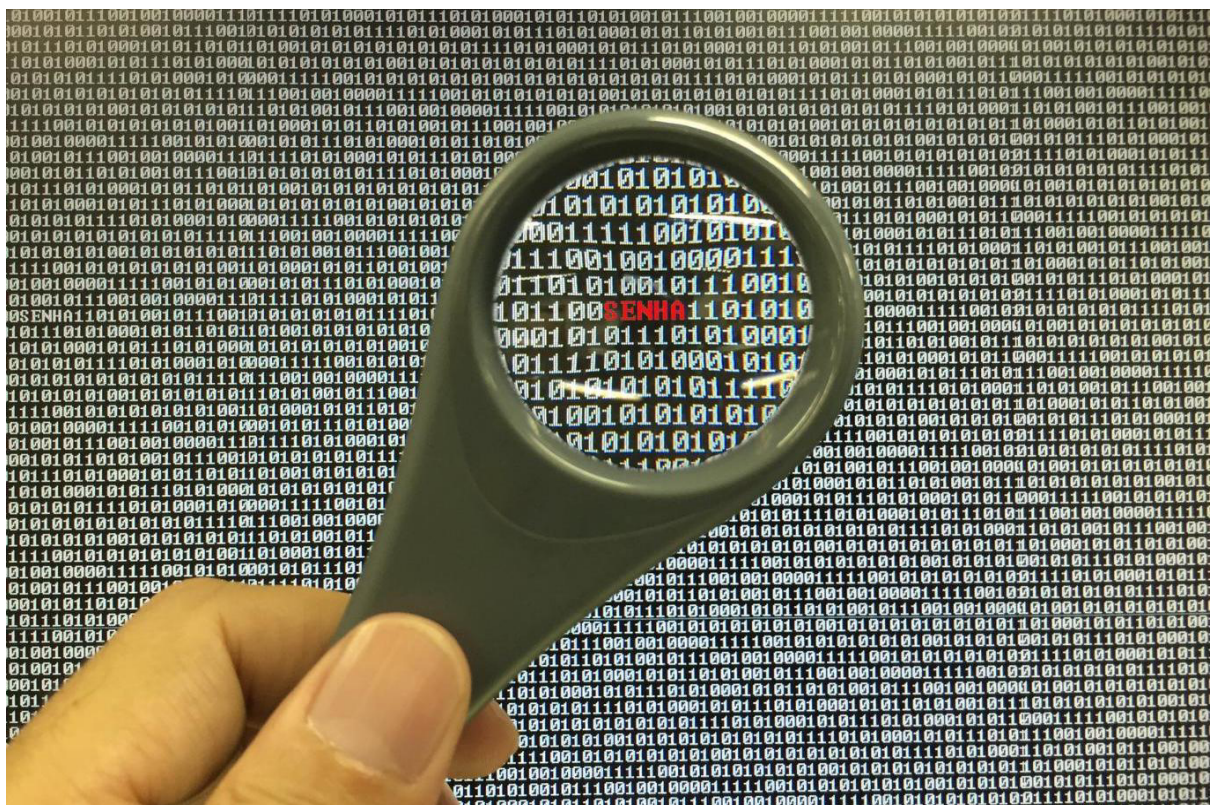
On introductions to vignette writing:

To our knowledge there are currently no good introductory texts - about how one moves from observations, field notes, interview data to the crafting of a final vignette. Perhaps the best way to advance is to learn from examples and to practice.

Readings:

Thorkelson, E. (2018, October 12). *The Vignette: A Bad Ethnographic Category*. Decasia: Critical Anthropology of Academic Culture. https://decasia.org/academic_culture/2018/10/12/the-vignette-a-bad-ethnographic-category/. (a critical blog post about vignette writing)

Session 7: Progress session



Readings:

STS-type analyses:

- Schwennesen, N. (2019). Algorithmic assemblages of care: Imaginaries, epistemologies and repair work. *Sociology of Health & Illness*, 41, 176-192. <https://doi.org/10.1111/1467-9566.12900>
- Van de Wiel, L. (2019). The datafication of reproduction: Time-lapse embryo imaging and the commercialisation of IVF. *Sociology of Health & Illness*, 41, 193-209. <https://doi.org/10.1111/1467-9566.12881>

Two STS-type analyses (in the direction of) of AI in healthcare in the journal *Sociology of Health & Illness*. In 2019 (Vol. 41) there was a special issue on Digital Health. Schwennesen's paper on algorithmic-based physiotherapy and van de Weil's paper on time-lapse imaging in IVF are the most appropriate to prepare students for the upcoming tasks. And, as it happens, there is also a paper on vaccination debates, prompted by Mark Zuckerberg's decision to vaccinate his own child.

Definitions of AI:

- Seaver, N. (2017). Algorithms as culture: Some tactics for the ethnography of algorithmic systems. *Big Data & Society*, 4(2), 1-12. <https://doi.org/10.1177/2053951717738104>

Definitions of AI can vary greatly depending on different actors. To make sense of this, read Seaver's article. Though he talks about the term algorithms, not AI or machine learning, his observations can be applied to the latter two terms as well. He argues for analysing algorithms as "emic" or "actor's terms".

Also, about definitional misunderstandings, it's fun to read the first pages of the chapter "Hello AI" in

- Broussard, M. (2019). *Artificial Unintelligence: How Computers Misunderstand the World*. MIT Press.

Session 8: Progress session



Skills: On confidentiality and interview ethics in preparation of the patient interview

Readings:

Kaiser, K. (2012). Protecting Confidentiality. In J. F. Gubrium, J. A. Holstein, A. B. Marvasti, and K. D. McKinney (Eds.), *The Sage Handbook of Interview Research: The Complexity of the Craft* (pp. 457-464). Sage Publications.

Heggen, K., & Guillemin, M. (2012). Protecting participants' confidentiality using a situated research ethics approach In J. F. Gubrium, J. A. Holstein, A. B. Marvasti, and K. D. McKinney (Eds.), *The Sage Handbook of Interview Research: The Complexity of the Craft* (pp. 465-476). Sage Publications.