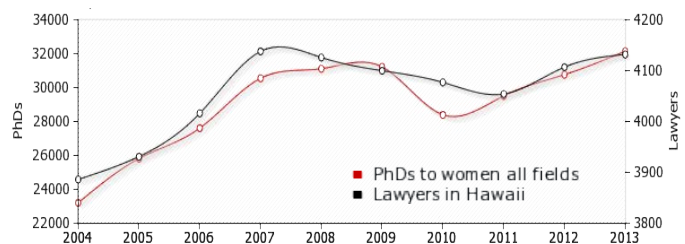


Propositions pertaining to the thesis  
*Automated treatment planning and non-coplanar beam angles in radiotherapy*  
Linda Rossi, 10<sup>th</sup> November 2020

1. Large numbers of beams can importantly enhance plan quality in stereotactic prostate radiotherapy. (Chapter 2)
2. A well-designed beam angle class solution can potentially result in treatment plans that are as good as plans with computer-optimized patient-specific beam configurations, avoiding the long calculation times involved in the latter. However, extensive computerized beam angle optimization studies may be needed to design a high-quality beam angle class solution. (Chapters 3 and 7)
3. Non-coplanar beam configurations can largely outperform coplanar configurations regarding plan quality. (Chapters 2, 4 and 6)
4. For benign tumours, automated planning can substantially reduce the dose bath without deterioration of doses in tumours and radiosensitive organs. (Chapter 5)
5. IMRT and VMAT are often considered mutually exclusive treatment approaches. However, they can be successfully combined for fast, high-quality treatments. (Chapter 7)
6. Defining optimality is often at least as complex as providing it.
7. For an observer of medical images, the left of the patient is on the right hand side. As if it were not easy enough to confuse the right with the left in everyday life. (Gormley 2018, Meakins 2003)
8. Human memory cannot store all the information pertinent to a problem domain. This potentially affects decision-making. Computer memory can be helpful in these cases to basically expand the human memory. (Jacob 1989)
9. Knowledge-based treatment planning has an inherent risk of accepting the current status of knowledge which is generally based on interactive trial-and-error planning, while better solutions may be feasible. (Tol 2015, Cagni 2017, Voet 2013, Sharfo 2018)
10. For treatment outcome modelling it is unclear to what extent the more complex modelling of clinical input data with deep learning will be useful without significantly enhancing quality and quantity of the input data itself.
11. When relying on statistical analyses, it is important to realize that the yearly number of women that get a PhD in any field in the US highly correlates with the total number of registered lawyers in Hawaii ( $r=0.96$ ).



<https://tylervigen.com/spurious-correlations>