

Propositions accompanying the thesis:  
**Improving feature-based non-rigid registration  
for applications in radiotherapy**  
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1. Since ground truth is most often impossible to obtain in non-rigid registration, it is imperative to develop standards to evaluate the accuracy and anatomically validate non-rigid registration methods. Openly available test data sets, for which ground truth is known, are only one part of it.
2. Non-rigid registration methods based on finite element analysis can provide accurate solutions if all input parameters are known for each particular case. Simpler models to characterize anatomical changes, such as thin plate splines, do not require such particular input and are sufficiently accurate for most clinical applications.
3. Non-rigid registration is a powerful tool for investigating the relationship between dose and shape changes in radiotherapy treatments. Such relationships can help gaining insight in effects of radiation used for treatment.
4. A major advantage of the method presented in this thesis is that including unstructured points, e.g., loose points representing anatomical landmarks, does not require complex modeling or any modifications.
5. Accounting for anatomical changes during photon radiotherapy is important. In proton radiotherapy, it is essential.
6. In academic publications, only positive findings are usually published. This strong bias creates enormous gaps in the knowledge generated from research.
7. “Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid.”

– Albert Einstein

8. Learning a new language requires more than learning a set of grammar rules and vocabulary. It also involves learning new expressions, gestures and discovering new concepts (e.g., ‘gezellig’ in dutch or ‘become’ in english do not have a direct translation in spanish). It’s as Charles the Great said: ‘To have another language is to possess a second soul’.
9. Having the mistaken idea of the FARC as a left movement fighting against the oppressors of the poor and victims of the colombian society, implicitly justifies their ransom kidnappings, production and distribution of cocaine, destruction of civilian infrastructure, and human rights violations.
10. “The greatest gift is the passion for reading. It is cheap, it consoles, it distracts, it excites, it gives you knowledge of the world and experience of a wide kind. It is a moral illumination.”

– Elizabeth Hardwick

11. “– But Libertad, you are putting it upside down!

– Upside down with respect to *what*? The planet earth is in the space, and the space neither has a *top* nor a *bottom*

All that about the northern hemisphere being the one on the *top*, is a psychological trick invented by those who *believe* they are on the *top*, such that *we who believe we are in the bottom, keep believing that we are in the bottom*. The problem is that if we *keep believing that we are in the bottom*, we will keep *being in the bottom*. And that’s an end to it!”

– free translation of the following cartoon by Quino.

