Aspects of the analysis of cell imagery: from shape to understanding
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Stellingen
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Aspects of the Analysis of Cell Imagery: from Shape to Understanding

1. To tell apart allergenic from non-allergenic pollen a balanced combination of microscopy imaging and image analysis is absolutely necessary. [Chapter 2]

2. As a computer scientist it is difficult to reveal the outcome of an automated deep learning classifier for pollen. Handcrafted features for pollen images however are easier to understand with a lower performance. We should accept a small compromise in order to gain in understanding. [Chapter 3]

3. The automated tracking of neutrophils remains a challenge unless the temporal resolution of the imaging is significantly increased. [Chapter 4].

4. In collecting neutrophil time-lapse sequences in a 3D space, a compromise between the Z-axis and time interval should be considered to reduce the physical limitations of the image as much as possible. [Chapter 5]

5. Tools for making ground truth data should be available, in order to be more successful in developing cell tracking using deep learning models. [Chapter 4&5]

6. Artificial intelligence is not yet mature enough to efficiently complete all tasks in cell imagery, it fails in understanding complex situations.

7. The innovation in cell imagery can be found by understanding the unresolved issues which always requires a multidisciplinary approach.

8. Training deep learning models is a learning process that mimics the human brain. It learns patterns initially from large datasets. With the input of new data, the model can be retrained and improved over time.

9. Computer scientists are typically equipped to play a key role in collaborating with experts from various fields and tackle interdisciplinary problems with advanced computational techniques.

10. The route to a Ph.D. is undoubtedly bumpy and challenging, however, the skills and experiences gained from it are invaluable. It brings significant benefits to our daily practices.

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