First person – Joanna Pylvänäinen

First Person is a series of interviews with the first authors of a selection of papers published in Journal of Cell Science, helping researchers promote themselves alongside their papers. Joanna Pylvänäinen is first author on 'Fast4DReg – fast registration of 4D microscopy datasets', published in JCS. Joanna is a PhD student in the lab of Guillaume Jacquemet at Åbo Akademi University, Turku, Finland, where she is interested in microscopy images and how to analyze them in the best possible way.

Joanna Pylvänäinen

How would you explain the main findings of your paper in lay terms?

In life sciences, researchers use microscopes to study living small organisms, such as cells or small animals. These experiments usually take many hours and are prone to having changes in the microscope surroundings, like changes in the temperature or shaking of the building – causing the sample and videos to move. To correct such movement, we made a tool called Fast4DReg. Fast4DReg can correct unwanted movement in microscopy videos or even re-align images taken with different colour lights. Overall, Fast4DReg makes it easy to fix drifting in microscopy images of living samples, so that scientists can better understand their images.

Were there any specific challenges associated with this project? If so, how did you overcome them?

Fast4DReg was first built as an extension of a tool called NanoJ, which is dependent on another software not needed for Fast4DReg. This software is not usually installed on computers by default. With the original developers of NanoJ, we were able to create a new version of Fast4DReg, which works independently from NanoJ and other software. This made the installation and usage of Fast4DReg much easier.

When doing the research, did you have a particular result or 'eureka' moment that has stuck with you?

While working on this paper I have started to understand and consider time as a dimension, not only as still frames. Many image processing operations are done using the x-, y- and z-dimensions (e.g. filtering and segmentation), but most of the time, movies are processed frame by frame. I don't yet know where this brain rewiring will take me, but surely, it has expanded my understanding of images as data.

Why did you choose Journal of Cell Science for your paper?

The Journal of Cell Science fits the research of our research group well. I appreciate the journal's not-for-profit philosophy and ethical policies. As a bonus, the University of Turku has an agreement with the journal that helps us to cover the publication fees. This way, funding is saved to do more research.

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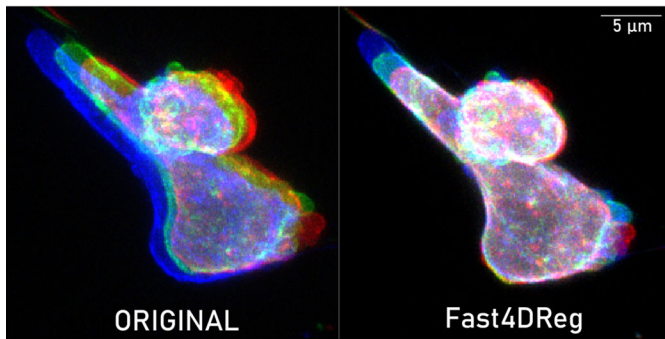E-mail: joanna.pylvanainen@abo.fi

Have you had any significant mentors who have helped you beyond supervision in the lab? How was their guidance special?

Much of the credit goes to my PhD supervisor, Guillaume Jacquemet, whose open-door policy allows me to easily chat to him in his office. He always has time to brainstorm ideas, help with small details and listen to whatever issue we are struggling with that day. Additionally, I'm in a fortunate situation where I have been able to include the best possible mentors in my PhD steering committee, Diana Toivola and Pasi Kankaanpää. I have worked with both before and during my PhD. Both have helped me tremendously to understand and navigate the complex academic world where many rules remain unwritten.

What motivated you to pursue a career in science, and what have been the most interesting moments on the path that led you to where you are now?

My career in science has been quite unusual. I have worked in research groups, research infrastructures and imaging core facilities in three different countries. Although I have been jumping from one job to another, retrospectively, my career path looks carefully planned. One of the most interesting (and scariest) moments was when I accepted a position to start building an image analysis core

A picture showing a cancer cell moving. The picture is coloured to show the cell's movement over time. Blue is the start, green is the middle and red is the end. The original picture shows that the cell is not in the same position at each time point. But, by using Fast4DReg, the picture was corrected so that the cell is in the same spot at each time point.

facility from scratch here in Turku in early 2020. This position made it possible for me to focus on image analysis and infrastructure building, as well as research. I feel like this combination really accelerated my development on a personal level and as a scientist.

Who are your role models in science? Why?

I admire people who have achieved a lot and still have time to discuss with younger generation scientists. My early mentors, Teng-Leong Chew (Janelia Research Campus) and John Eriksson (Euro-BioImaging ERIC) have introduced me to the exciting world of imaging infrastructures – their impact on my career has been significant. Later on, I worked with image analysis super-heroes such as Jean-Yves Tinevez and of course my PhD supervisor Guillaume Jacquemet – both excellent role models, who share similar values and visions to me.

What's next for you?

Who knows! I hope next year this time I will be at the finishing line of my PhD. I already have ideas and opportunities for future, but nothing is set in stone yet. In the future, I see myself working with microscopy images, maybe in a core facility or in a research group.

Tell us something interesting about yourself that wouldn't be on your CV

I love snow, mountains and snowboarding. I come from inland Finland where snow remains snow the whole winter – this is not the case in coastal Turku. If my career opportunities in Finland weren't all here, I would probably like to be somewhere further north and enjoy cross-country skiing to work (this is on my bucket list anyway).

Reference

Pylvänäinen, J. W., Laine, R. F., Saraiva, B. M. S., Ghimire, S., Follain, G., Henriques, R. and Jacquemet, G. (2023). Fast4DReg – fast registration of 4D microscopy datasets. *J. Cell Sci.* **136**, jcs260728. doi:10.1242/jcs.260728