

## **Application for the creation of the Image Analysis Focused Interest Group of the Royal Microscopical Society.**

The dependence of the biosciences on image analysis is growing [1]. There is now a clear need for a trained and better-organised community of image analysts who will support this growth [2,3]. The NEUBIAS network [4] is a relatively new initiative, setup to help address these issues on a EU and, increasingly, international level. Presently, there is very little activity nationally in the UK that complements this work of supporting image analysis. At a recent meeting of the Royal Microscopical Society (RMS) council, the importance of image analysis for microscopy was discussed. The RMS are very keen to assist in the formation and activity of a Focused Interest Group (FIG) whose role will be to develop and support the image analysis community in the UK. To this end, following several successful meetings and discussions, this document has been drafted to describe the formation of the Image Analysis Focused Interest Group of the RMS (IAFIG-RMS). The goal of the IAFIG-RMS will be to support and develop the Image Analysis community in the UK and the application of this science to the field of microscopy in all its forms. In the first instance, Dr. Dominic Waithe will act as chair for the proposed group having being nominated by Mr. Alex Sossick and confirmed by Dr. Lucy Collinson, both section chairs of the RMS.

The NEUBIAS network has a key focus on developing the interests of bioimage analysts. A bioimage analyst is defined as follows: "Bioimage analysts are a new type of experts in biolmaging, they select appropriate image processing algorithms and their implementations, and assemble them for conducting practical Bioimage Analysis." [5]. The remit of the IAFIG-RMS will include the interests of the bioimage analysts in the UK as well as all the other types of scientist who in some way are involved in microscopy image analysis. This will include mathematicians, research engineers, bioinformaticians, biophysicists, bioscientists, microscopists, computer vision scientists and any other scientist who has some involvement in microscopy image analysis. We want to actively encourage scientists and engineers from a variety of disciplines to collaborate providing training and support to those in more applied roles. This will take the form of workshops, and conference sessions, designed to raise awareness for image analysis within microscopy and to attract skilled professionals to contribute to this field.

It is clear that at this stage no one model of career structure is appropriate for the image analysis community as a whole, especially for those embedded in non-numerical disciplines [2,3]. We believe it should be possible for image analysts of all levels to apply for funding and support based on the justifiable popularity of an algorithm or piece of software for example. Part of the responsibilities of the IAFIG-RMS will be to communicate with funding bodies to provide enhanced backing and resources for image analysts working actively in training, support, development and research. This will work in two ways: Firstly in terms of communicating what funding bodies are doing and planning for the community, as well as helping form a structured picture of the community for the benefit of the funding bodies. To help with representation, the IAFIG-RMS will encourage the appointment of image analysts and related members on funding bodies and other decision-making councils. The IAFIG-RMS will work to popularise these approaches and will work diligently with funding bodies, the scientific community and the government for more appropriate career options for those performing image analysis.

Many image analysts perform some kind of training in their day-to-day support and research work. We would like to incentivise the running of training courses in two ways. Firstly if individuals consistently organise or support image analysis events we would like to recognise their contribution with an affiliation (e.g. IAFIG-RMS Trainer).

We would also like to reward those who have attained a certain level of training by attending multiple courses. We will also encourage and support users to make their materials public, taking advantage of the existing NEUBIAS infrastructure as well as content (website, mailouts) that publicise the resources already in existence. Furthermore, the IAFIG-RMS will encourage courses for its members of all levels boosting the skills and training of the community as a whole. In addition, we would act as a group to assist and reinforce the training being performed already for bioimage analysis in the UK. This would involve getting trainers accredited by other trainers before they run courses and through providing feedback as necessary, as well as through sharing teaching materials. The UK has many organisations and companies that actively apply image analysis in different ways and who also promote best practise for programming and software development. The IAFIG-RMS will work to actively encourage engagement with existing UK based training schemes, (e.g. Software Carpentry, NAG, ARCHER, ImageJ/Fiji, OME) as well as with companies (e.g. Google, Zeiss, Olympus, SVI, Leica).

UK Science is respected throughout the world and part of this reputation stems from the high-standards and integrity which it maintains. The IAFIG-RMS community believes that integrity, and its upkeep, is key to the future of research and that the IAFIG-RMS will be able to contribute to this positively. One of the goals of IAFIG-RMS will be to outline the key aspects of image acquisition, processing, and analysis and promote best practise for its practitioners. This will provide a guideline for reproducible image analysis which life scientists and physical scientists can refer to for the publication of their research. Journals will also be able to refer to this resource as it will represent a consistent guideline to which they can adhere. Journals will also be able to request the assistance of IAFIG-RMS members for certain tasks which will have a positive effect on publication quality. Furthermore, grant-awarding bodies will be able to contact members of the IAFIG-RMS for reference and clarification.

The IAFIG-RMS will utilise the best online resources to support its members and create a community. An official website will be constructed, [www.IAFIG-RMS.org](http://www.IAFIG-RMS.org), which will explain what IAFIG-RMS is and will also publicise its activities and members through web links. A JISC email list (IAFIG-RMS@JISCMail.AC.UK) and a forum will be created to support and promote day-to-day discussion on image analysis related topics. A committee will meet in person every 6 months to discuss progress and define goals. The meetings will be open to anyone to attend, and those who consistently attend meetings will be designated as IAFIG-RMS committee members.

[1] A Pilot Survey on Bioimage Analysis Needs 2015: Results Summary (Kota Miura)

[2]

<http://www.nature.com/nature/journal/v540/n7632/full/540199c.html?foxtrotcallback=true>

[3] [https://dwaithe.github.io/blog\\_20161127.html](https://dwaithe.github.io/blog_20161127.html)

[4] <http://www.eubias.org/NEUBIAS/>

[5] [http://eubias.org/NEUBIAS/venue/global-planning/#Bioimage\\_Analysis\\_BIAS](http://eubias.org/NEUBIAS/venue/global-planning/#Bioimage_Analysis_BIAS)