

Collaborative research and sharing data ahead of paper publication

A case study of De Montfort University's Dr. Fabio Caraffini

Key Points

- By sharing his high-resolution, multispectral images prior to a paper publication on DMU Figshare, Fabio and his colleagues are building public engagement with their research.
- Storing large amounts of data in DMU Figshare allows Fabio and his colleagues to link to that data in a paper, which they would have otherwise just had to describe in the body of the paper.

Fabio Caraffini is a senior lecturer in Computer Science and Mathematics at De Montfort University (DMU). Fabio's public research data is available on dmu.figshare.com and his [profile page is available here](#).

Fabio's research is in artificial intelligence and algorithmic design for optimization problems. This work is mostly theoretical but it's becoming more applied in areas like business and robotics with regard to forecasting business growth or optimizing the performance of a robot, respectively.

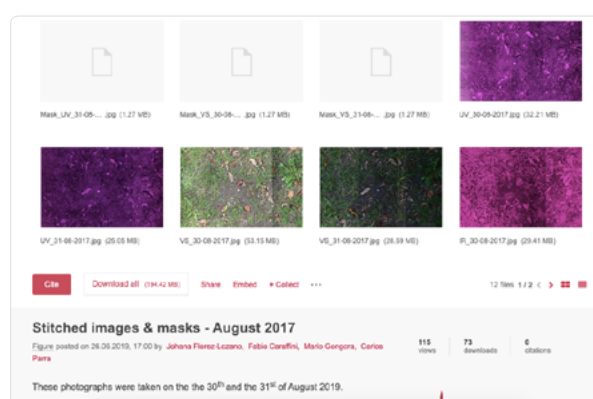
Recently, Fabio has expanded his collaborative applied research with universities and agricultural colleagues in Colombia. Fabio and his colleagues are researching how best to use agricultural land in Colombia; to do this, they will build a device capable of detecting debris and improvised explosive devices (IED). This will involve theoretical development in terms of artificial intelligence and an application with data, which is what Fabio has shared on DMU Figshare. "I found it helpful from a logistics perspective," said Fabio. "We have a lot of data from high-resolution, multispectral images, each one around two gigabytes. I can share these and assign them a license, a DOI, and make them publicly available."

Fabio and his colleagues have a paper analysing this data under review, but the data – the images – are publicly available. People have been reaching out to Fabio with questions regarding the data before the publication of their paper.

They are also working on a project to eradicate Lethal Wilt (Marcites Letal in Spanish), a disease plaguing Latin America crops, from an oil palm plantation in

Colombia that is ethically growing palm oil for a range of products, including biodiesel and cosmetics, on land which otherwise would have been unused. Local experts are able to identify the symptoms of this disease but don't know how it's spread or how to cure it.

Because this disease is highly contagious, Fabio and his colleagues' research objective is to develop an optimized system for understanding if a plant is ill six months in advance. At this stage, the disease can be identified a few months in advance, but they're still working toward being able to identify it six months in advance. Using a drone, they are taking multispectral images of the plantations and using artificial intelligence to create neural networks. From these networks, they are creating systems that are capable of learning from data. However, to support this learning, they need large amounts of data. They're using DMU Figshare to store this data. "Without a repository to store this data, it's pretty much impossible to publish the data in a journal," said Fabio. "You don't have space in a paper to store these large datasets. You can describe them, but it's better to link to a repository."



Florez-Lozano, Johana; Caraffini, Fabio; Gongora, Mario; Parra, Carlos (2019): Stitched images & masks - August 2017. figshare. Figure. <https://doi.org/10.21253/DMU.8314520.v1>