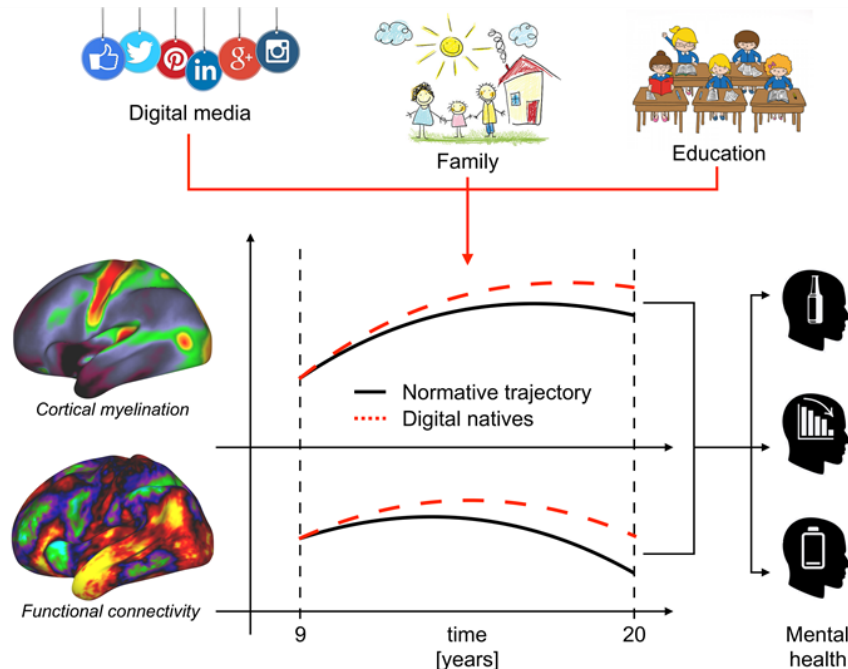




Discovering novel multimodal neuroimaging biomarkers of resilience to mental health disorders in the developing brain of digital natives



Supervisors: Dr Matteo Bastiani (School of Medicine)

Theme: Brain and mental health imaging / Computational imaging and mathematical modelling

Project description: Digital natives, i.e., the current generation of youths who have been exposed to the internet since they were born, typically spend between 6 to 9 hours in front of a screen. This time is not only devoted to passive activities (e.g., movie-watching), but also to active social interactions via social media platforms. Such constant interactions, in a life period when parental influence decreases and peers' acceptance becomes more important, can strongly affect the mental well-being of an adolescent. However, factors such as education and family history can influence personal resilience against negative social feedback. Therefore, it is crucial to understand how different types of digital media exposure shape the developing brain and which factors influence its resilience.

Neuroimaging data can provide unique ways to probe the developing brain's tissue microstructure and network connections. However, such data do not directly provide quantifiable information. Extracting relevant features from big longitudinal datasets represents a necessary step to identify early digital media-induced deviations from normative developmental trajectories that can lead to severe mental health issues later in life.

The project aims at developing novel ways for performing neuroimaging data analysis in order to extract accurate imaging markers that are linked to the neural correlates of resilience to mental health disorders in digital natives. The analysis tools will be complemented with a predictive modelling framework that will allow us to extract accurate markers from population data and to validate derived personalised brain signatures against relevant resilience parameters. Using longitudinal multi-modal data at the population level, such as the Adolescent Brain Cognitive Development (ABCD) study (<https://abcdstudy.org>), and exploratory approaches will allow us to develop tools that aid identification of generalizable imaging-derived signatures of both brain function (i.e., normal behaviour) and dysfunction due to mental health disorders.

Lead school: School of Medicine

To apply for a place on the programme you will need to:

1. join the open day on **9 January** or contact a potential supervisor. If you wish to join the open day, please e-mail PI-Beacon@nottingham.ac.uk

2. [apply online here by](#) **17 January**

3. on submission send an email to PI-Beacon@nottingham.ac.uk stating your preferred project, application ref number and enclose a CV

For any enquiries please email PI-Beacon@nottingham.ac.uk