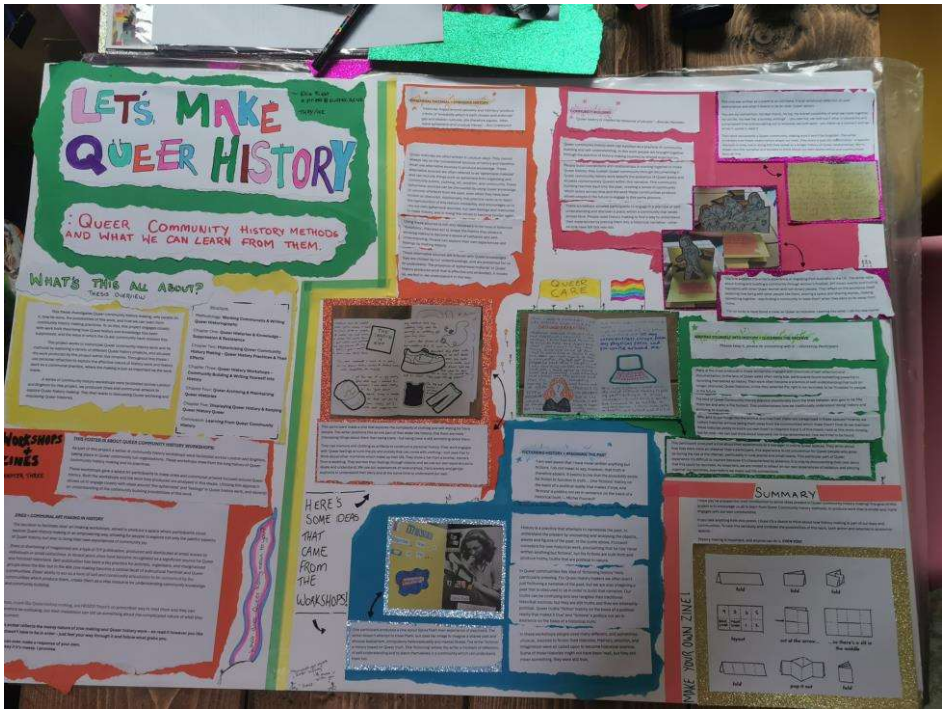
2024 Research Poster Competition

Competition Entries

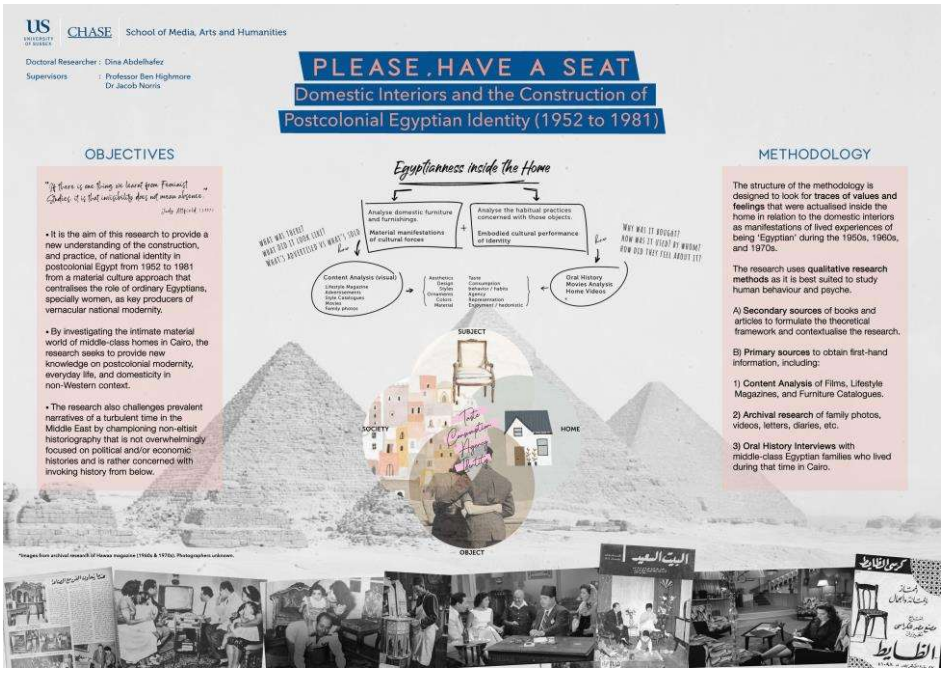
Wearable-Based Monitoring and Stimulation for Focal Task-Specific Dystonia - *Muyun Cai (Engineering & Informatics)*



Let's Make Queer History! : Queer community history methods and what we can learn from them - *Ellie Priest (Media, Arts & Humanities)*

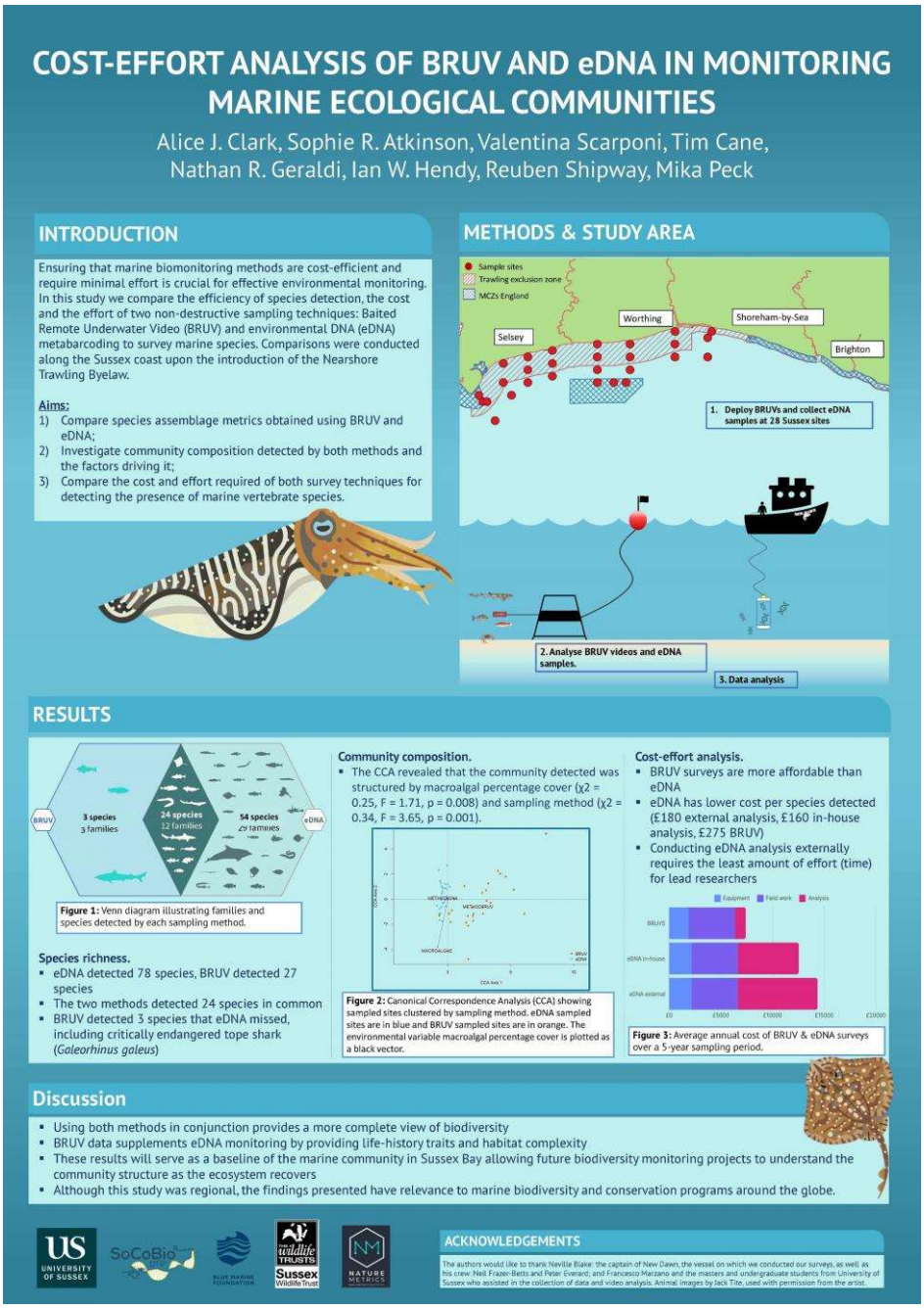
Taking Nature to People

Can using art and design principles enhance the health benefits of nature-based interior architecture?
- Mark Ware (Engineering & Informatics)

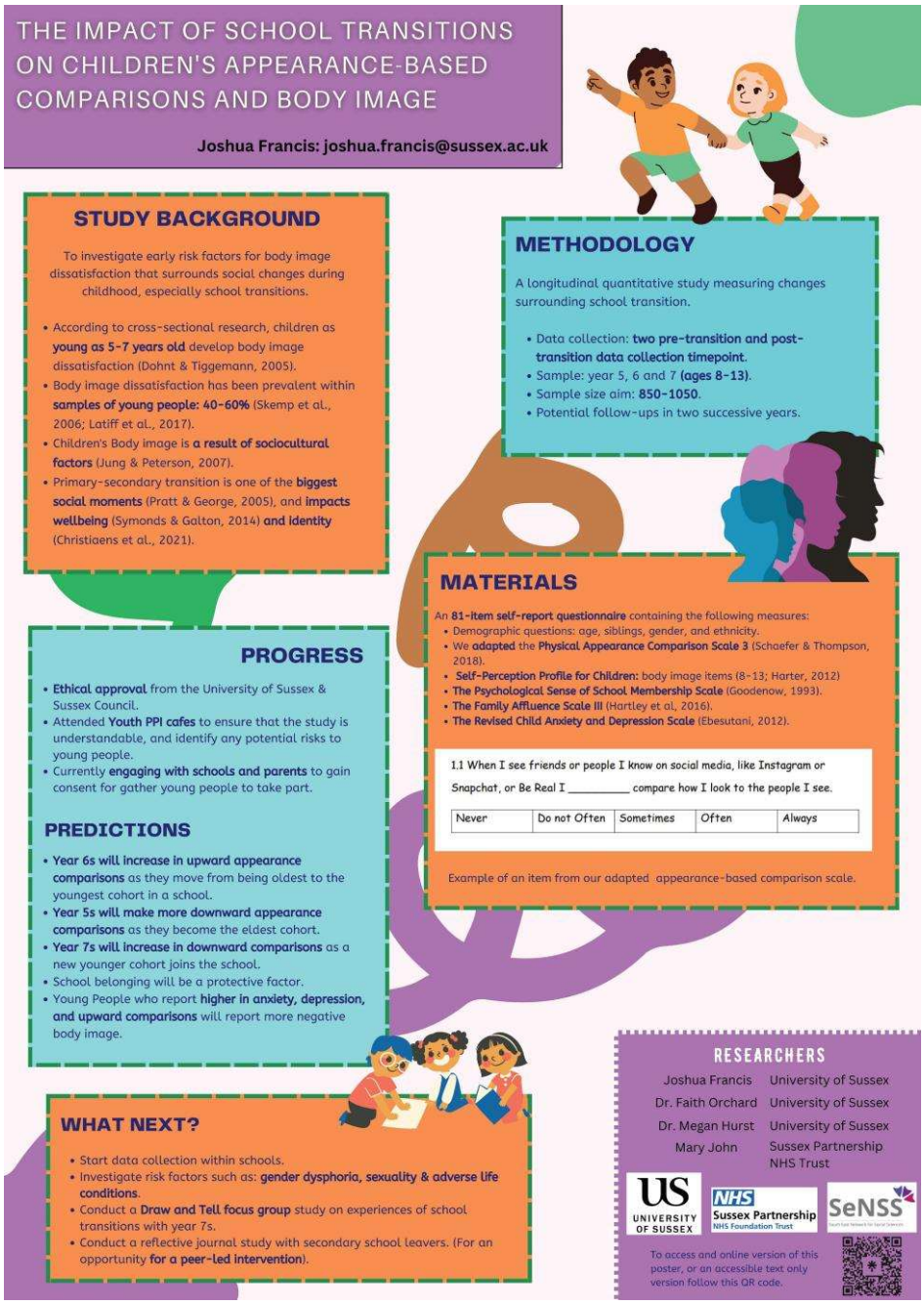


Please, Have a Seat: Domestic Interiors and the Construction of Postcolonial National Identity in Egypt (1952-1981) - *Dina Abdelhafez (Media, Arts & Humanities)*

Empowerment, Protest and Celebration: The representation of 'Black Girl Magic' in Speculative Fiction and Contemporary Culture - *Riziki Millanzi (Media, Arts & Humanities)*



Cost-effort analysis of BRUV and eDNA in monitoring marine ecological communities - *Alice Clark (Life Sciences)*



The Impact of School Transitions on Children's Appearance-Based Comparisons and Body Image - *Joshua Francis (Psychology)*

DMN and the 4-day working week

Magdalena Pfaff[1], Joanna McLaren[1], Sinead Moore[1], Chris Racey[1], Samira Bouyagoub[2], Daniel Campbell-Meiklejohn[1], Sarah Garfinkel[3], Charlotte Rae[1]

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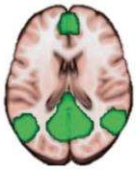
Introduction

The Default Mode Network (DMN) is typically active during rest, introspection, or when retrieving episodic memory and entails the dorsal medial prefrontal cortex, the medial lateral parietal, and the posterior cingulate cortex[1,2].



DMN connectivity can be influenced by factors, such as sleep, stress, or occupation[3].

Pilot data of the 4DW has been shown to improve sleep and decrease stress. Therefore, changing to a 4DW could alter DMN connectivity, possibly by decreasing stress and improving sleep.

How does a 4-day working week influence DMN connectivity?

How do the results differ depending on the mask used?

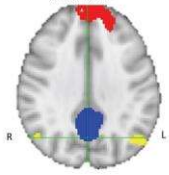
Methods

Participants
35 full time employees (age 20-50; mean 35,5; 60% male) working 5-days per week with no no eligibility limitations(business sectors, or prior (mental) health diagnoses) were recruited.

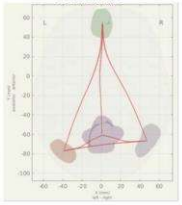
Data Collection
With no loss of pay, participants switched to a 4-day week for 12 weeks. Resting state data was collected at week 1 and week 12.

Analysis
After preprocessing the data, two the Shirer (2012) and CONN masks were applied to do Region of interest (ROI) to ROI analysis to observe whether there was a difference in DMN connectivity pre-compared to post-4DW trial. There were analysed using functional connectivity and graph theory.

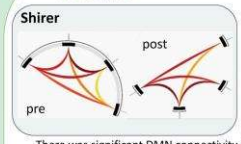
Shirer Mask



CONN Mask



Results

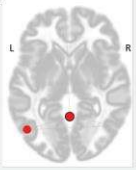


There was significant DMN connectivity in the pre and the post 4DW trial with both masks.

Shirer

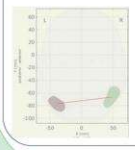
While the Shirer mask showed significantly higher connectivity between the left lateral parietal and the posterior cingulate cortex in the post-4DW trial, other graph theory measures did not yield significant, yet indicative results of stronger connectivity in the post 4DW trial. The functional connectivity measures did not show significant differences between the trials with the Shirer Mask.

Significant results in betweenness centrality with a FDR corrected p-value of 0.0367.



	T	Uncorrected p-value
Global Efficiency	-1.87	0.070
Local Efficiency	2.03	0.051
Betweenness centrality (total network)	-2.61	0.013

CONN



When applying the CONN Mask, the functional connectivity was significantly increased in the post 4DW trial between the left and right lateral parietal. The Graph theory results were not significant when applying the CONN ROIs.

Discussion

DMN connectivity was stronger post 4DW trial using both masks. However, the results differed depending on which mask was used.

These changes in connectivity could possibly be explained by the improved sleep and decreased stress resulting from the 4DW.

Further analysis, such as ICA, and increasing the sample size will be done in the future.

References

1) Vessel, E. A., Starr, G. G., & Rubin, N. (2013). Art reaches within: aesthetic experience, the self and the default mode network. *Frontiers in neuroscience*, 7, 258. https://doi.org/10.3389/fnins.2013.00258
2) Raichle, M. E. (2015). The brain's default mode network. *Annual review of neuroscience*, 38, 433-447. https://doi.org/10.1146/annurev-neuro-071013-014030
3) Krause, A. J., Simon, E. B., Mander, B. A., Greer, S. M., Saletin, J. M., Goldstein-Piekarski, A. N., & Walker, M. P. (2017). The sleep-deprived human brain. *Nature Reviews Neuroscience*, 18(7), 404-418. https://doi.org/10.1038/nrn.2017.55

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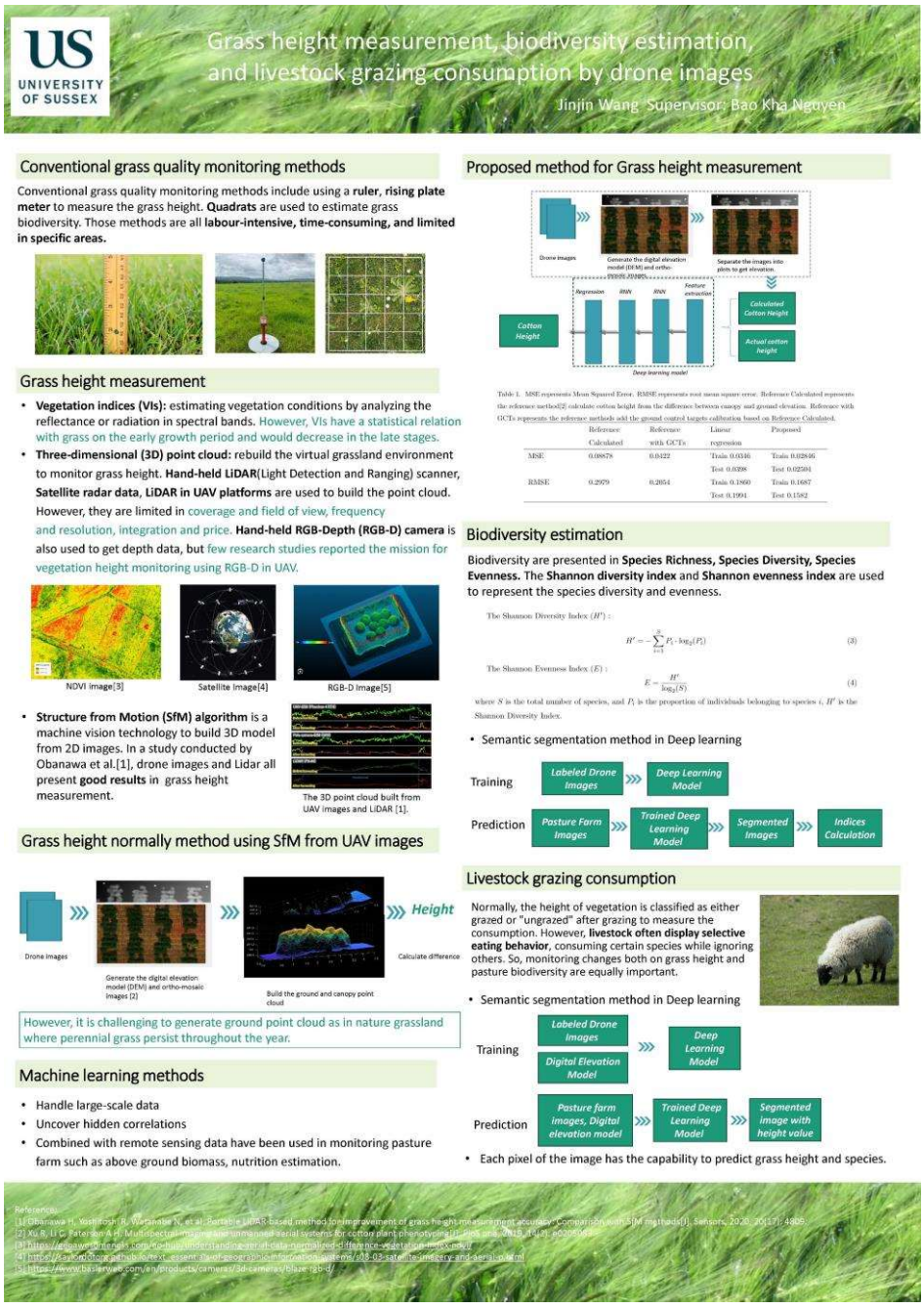
Default Mode Network and the 4-day working week - *Magdalena Pfaff (Life Sciences)*



Grass height measurement, biodiversity estimation, and livestock grazing consumption by drone images *- Jinjin Wang (Engineering & Informatics)*