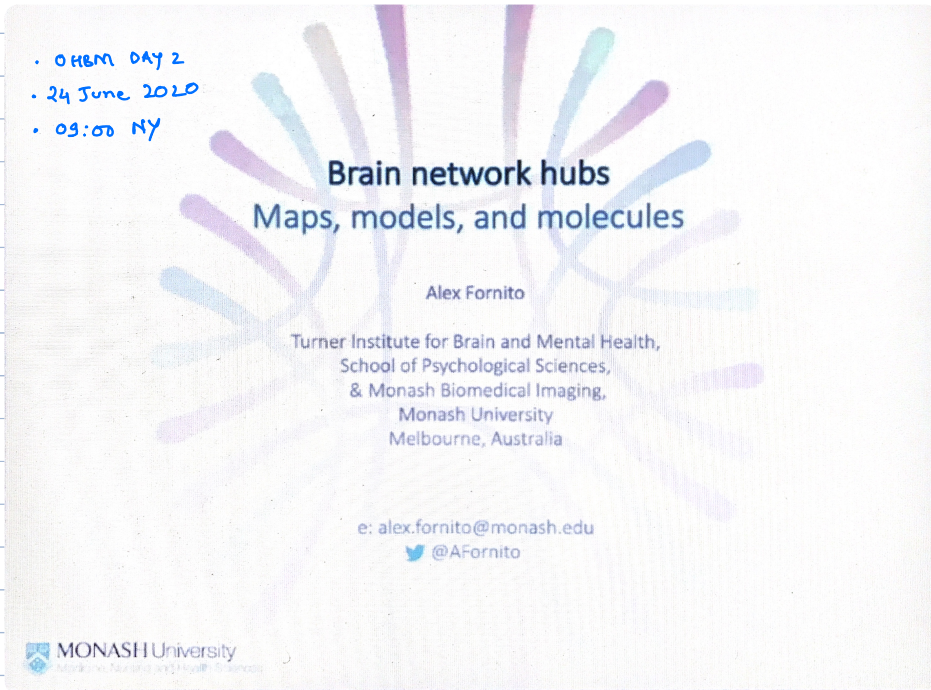
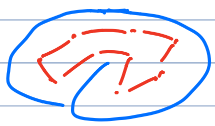
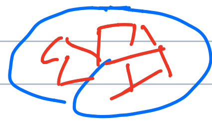


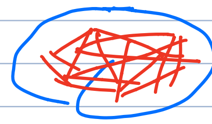
Regular Topology
- conserve material



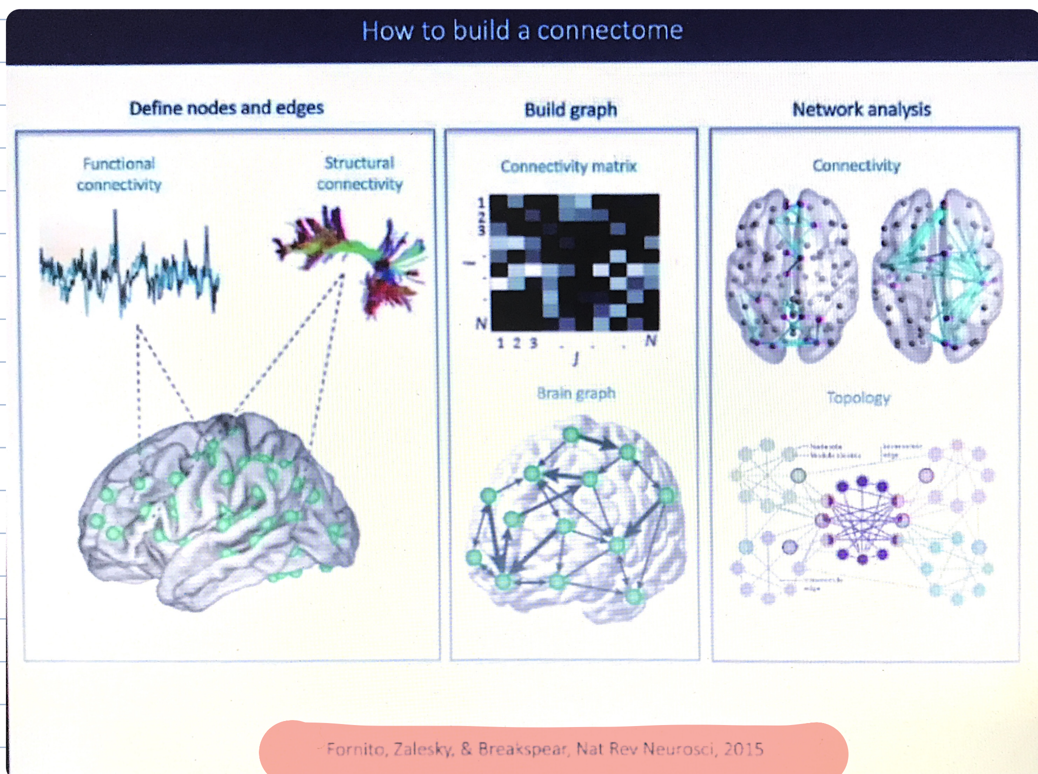
Complex topology
- Network economy

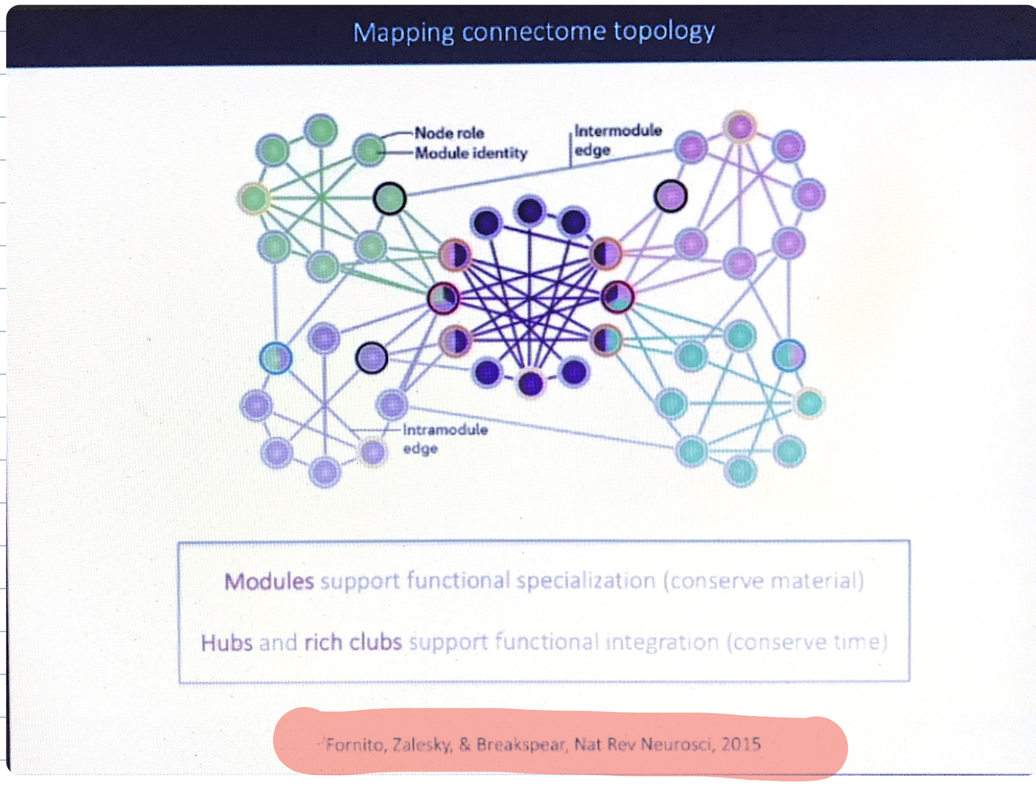


Random Topology
conserve time



left —— COST ↑ / time ↓ ——▷ Right





Majority of presentation based on this

Fulcher & Fornito, PNAS (2016) : $\phi(k) = \dfrac{2E_{>k}}{N_{>k}(N_{>k}-1)}$ ← No. of connectⁿ ← Total possible connectⁿ b/w hubs

[A lot of details were mentioned from this paper]

Hubs are costly ⇒ high metabolic demand ⇒ implicated in disease eg: Alzh., Schizo, depression etc.

Vaishnavi et al, PNAS, 2010; Buckner et al, J Neurosci, 2009; Crossley et al, Brain, 2014

Modelling cost value trade-off in the connectome

(Betzel et al Neuroimage, 2016 ; Vertes et al. PNAS, 2012)

$$P_{uv} \propto D_{uv}^{-\eta} \times T_{uv}^{\gamma}$$

connectⁿ probability — wiring cost — topology

η & γ are +ve ⇒ we can see connectⁿ probability is inversely proportional to wiring cost & directly proportional to topology

Note: the presentation went too specific after this, better read papers if you need to research on this topic.