Science Foundation Ireland **SFI** For what's next

CO∩∩ECT
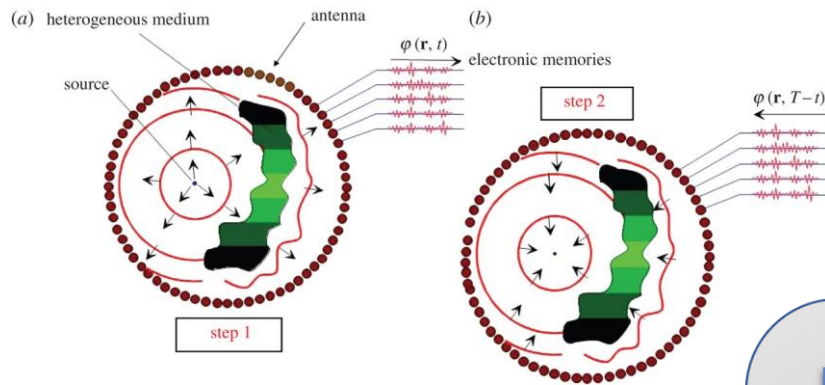Centre for Future Networks

Here comes the general
theory of the edge of reversibility

(or: working on systems theory while developing reversible algorithms for cyber-physical systems)
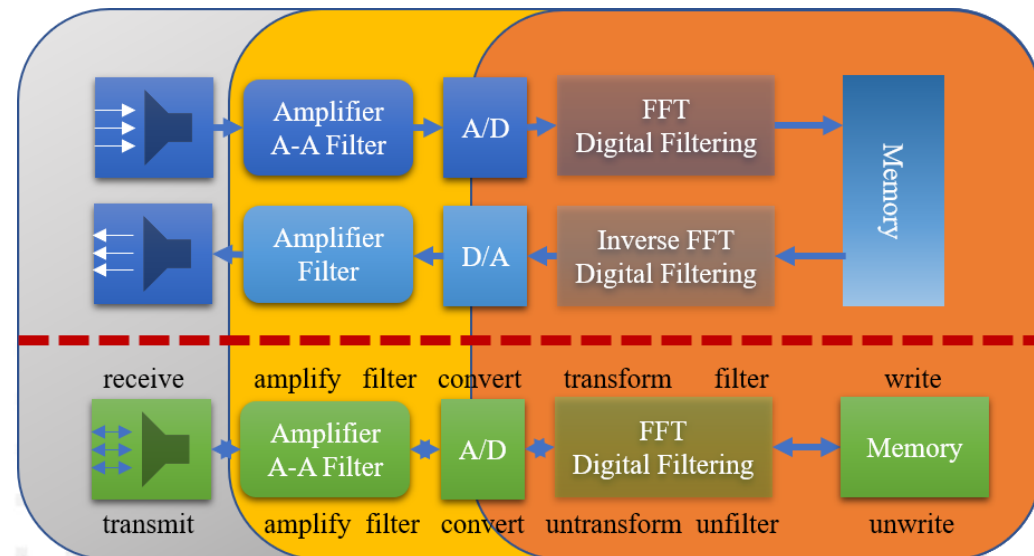
Dr Harun Šiljak
CCC Reversible Computing Workshop
07/10/2020
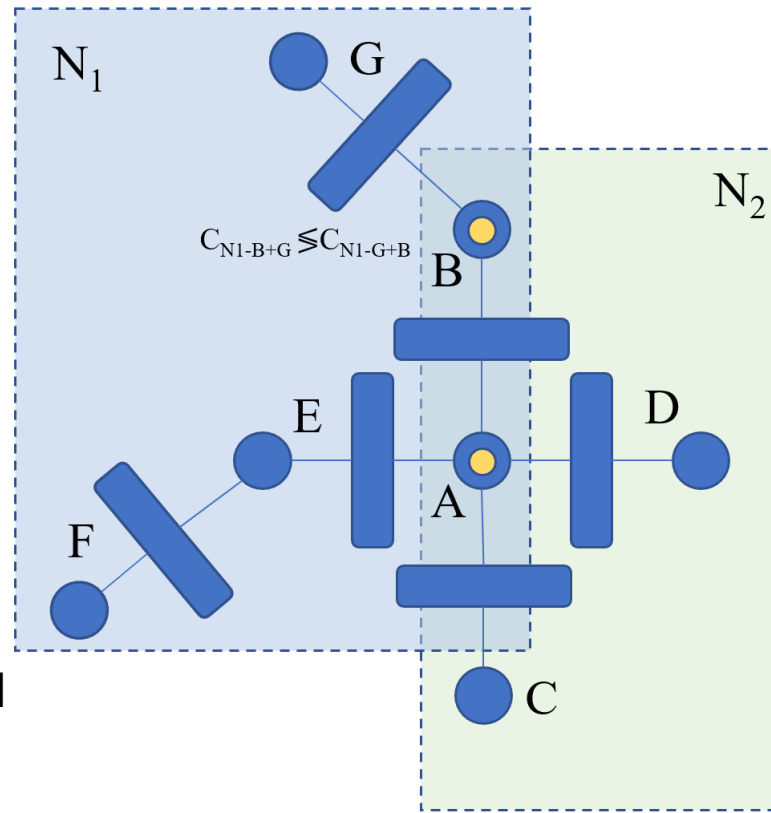
Something reversible-ish on the outside (or: what's EoR anyway?)

Edge of reversibility

Reversible computing doing signal processing for communication over a somewhat reversible communication channel

Siljak, H., de Rosny, J. and Fink, M., 2020. Reversible hardware for acoustic communications. *IEEE Communications Magazine*, *58*(1), pp.55-61.

Something reversible-ish on the outside (take 2)

Reversible managing resources for radio communication over a somewhat reversible communication channel

$C_{N1-B+G} \lessgtr C_{N1-G+B}$

Siljak, H., Psara, K. and Philippou, A., 2019. Distributed antenna selection for massive MIMO using reversing Petri nets. *IEEE Wireless Communications Letters*, *8*(5), pp.1427-1430.

Variants of the coupling at the EoR

- Multiple reversible (what flavour of reversible?) systems
- Reversible and irreversible/partially reversible (how partially? Temporally, spatially?)/least irreversible systems
- Error-correcting and don't-care-about-errors-systems
- Control systems, the hill under the rug (stop hiding them, consider everything as an augmented closed systems)
- Engineering shortcuts to something-like-adiabaticity

Thank you

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