

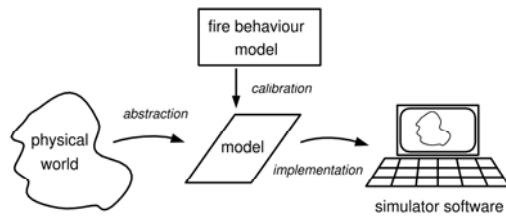


A heat transfer simulation model for wildfire spread

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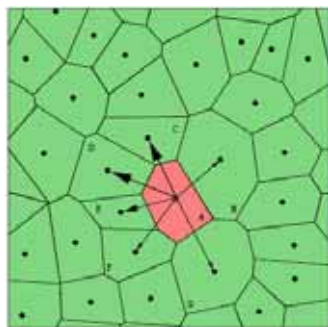
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Simulator development



UWA Bushfire Simulator: approach taken

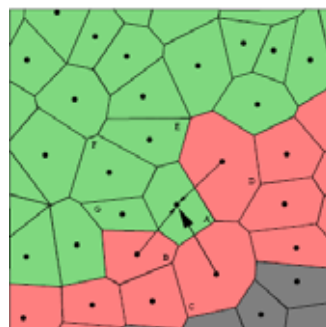
- use an underlying heat transfer mechanism
- generate, transport and consume heat quanta
- based on 2nd Law of Thermodynamics
- occurrence of *discrete* heat transfer events
- occur between *discrete* landscape patches



Wind direction is SE

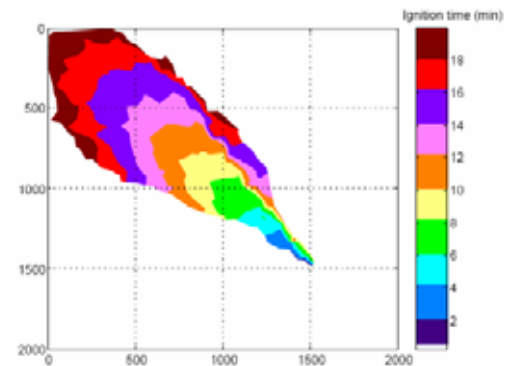
Patch behaviour

- burning patches *generate* heat
- unburned neighbours *consume* heat
- heat *transferred* from hot to cold (2nd Law)



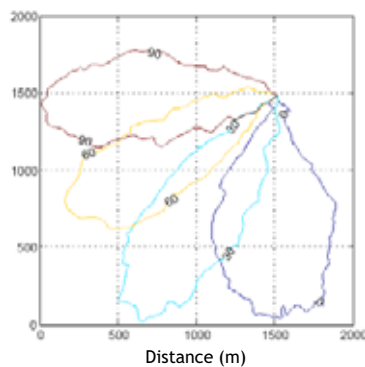
Patch interaction and system behaviour

- discretise landscape into approximately equal sized polygon patches
- patches have neighbours - share common boundaries
- collection of patches form an interacting *system*
- system exhibits dynamic behaviour
- patches burn, generate heat, and interact to communicate heat between, as in a real bushfire

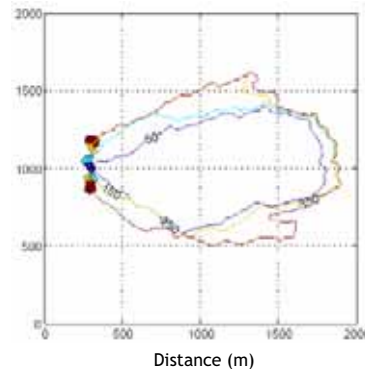


Initial Results

Varying wind direction



Varying ignition width, westerly wind



Wangary, SA grass fire January 11, 2005

