IV. Intelligent Behavior

- Behavior Tree Notation for medical robotics?

- Marzinotto et al., ICRA 2014

Behavior Trees

- Video Game Industry
- Notation for composition of behaviors

Behavior Trees

- Root generates periodic ‘tics’
- A ‘pointer’ designates a single active node
- At each tick the active node can return:
  - "Working"
  - "Success"
  - "Failure"
- Leaf = robotic procedure / macro / control loop

Node types

- **Selector**
  - Pass the tick to each child in turn
  - Return Success when first child returns Success (try each child).

- **Sequence**
  - Pass the tick to each child in turn
  - Return Failure when first child returns Failure (perform each child in sequence)

- **Parallel**
  - Launch all children simultaneously
  - Return Success when > 50% of children return Success.

Diagrams:

- Selector
- Sequence
- Parallel

Example
Behavior Trees: Medical

• Medical Behavior

Blood Draw


Emergency Airway

Algorithm

Source: emcrit.org
(http://emcrit.org/blogpost/shock-trauma-center-failed-airway-algorithm/)

http://orangecountyfl.net/emsref/