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 Comments :
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Proposal/Report: Assignment 1 (Finite State Machine)

FSM #1 (Main NPC) IN "TRAINING" STATE:

States

d = distance, HP = health points

- When idle && (d <= 20u) && NPC HP > 30%, **CHASE** enemy.
- When chasing && (d <= 5u), **BATTLE** enemy.
- When battling && (d > 5u) && NPC HP > 30%, **CHASE** enemy.
- When NPC HP < 30%, NPC **RUN** away.
- When enemy HP <= 0, go **IDLE**.
- When idle && HP gets minus, go **BATTLE**.
- When idle && NPC HP < 30%, switch to **HUNTING** state.
- When NPC HP <= 0, NPC **DIES**.

Conditions

d = distance, HP = health points

- When **idle && (d <= 20u) && NPC HP > 30%**, CHASE enemy.
- When **chasing && (d <= 5u)**, BATTLE enemy.
- When **battling && (d > 5u) && NPC HP > 30%**, CHASE enemy.
- When **NPC HP < 30%**, NPC RUN away.
- When **enemy HP <= 0**, go IDLE.
- When **idle && HP gets minus**, go BATTLE.
- When **idle && NPC HP < 30%**, switch to HUNTING state.
- When **NPC HP <= 0**, NPC DIES.

IN "HUNTING" STATE:

States

d = distance, HP = health points

- When idle && (d <= 20u), **CHASE** prey.
- When chasing && (d <= 5u), **BATTLE** prey.
- When enemy within d <= 30u, **RUN** away.
- When battling && (d > 5u), **CHASE** prey.
- When prey HP <= 0, go **IDLE**.
- When HP < 30%, go **IDLE**.
- When HP >= 30%, switch to **TRAINING** state.
- When NPC HP <= 0, NPC **DIES**.

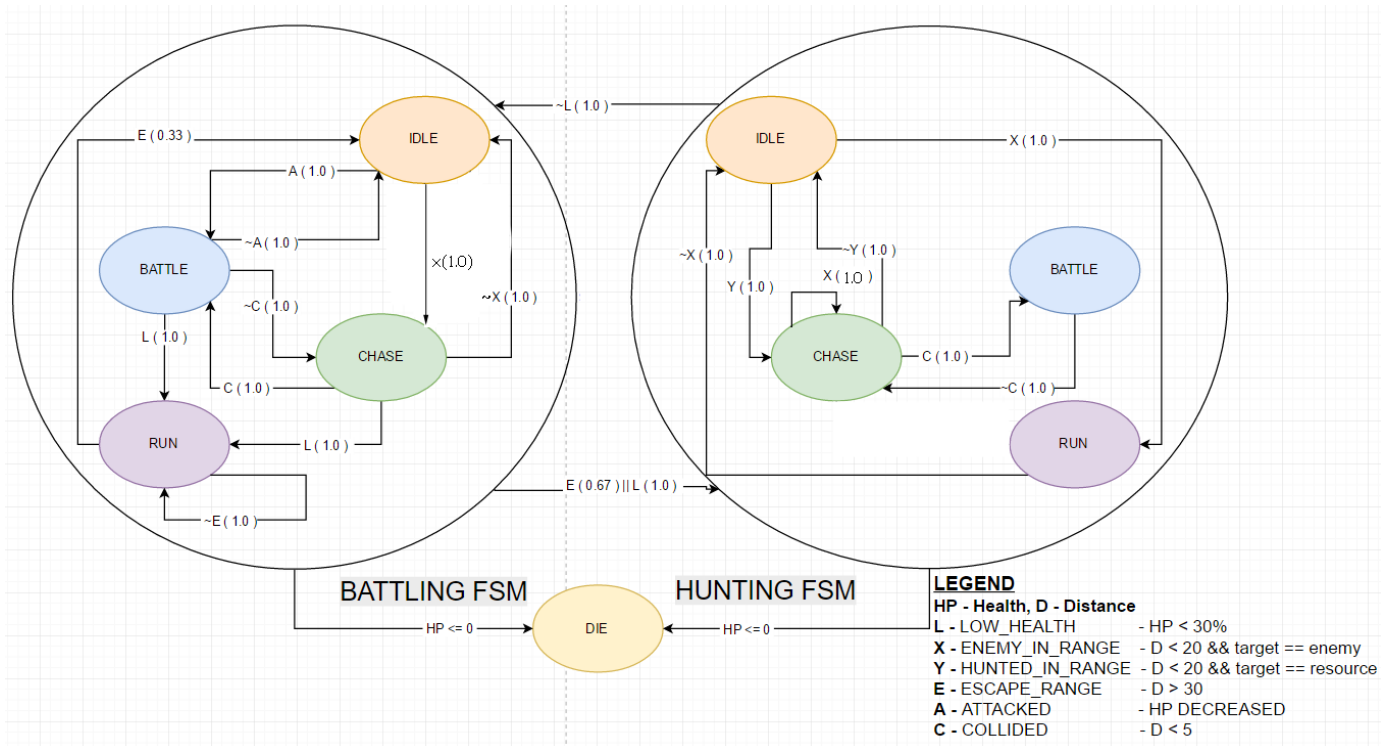
Conditions

d = distance, HP = health points

- When **idle && (d <= 20u)**, CHASE prey.
- When **chasing && (d <= 5u)**, BATTLE prey.
- When **enemy within d <= 30u**, RUN away.

- When **battling && (d > 5u)**, CHASE prey.
- When **prey HP <= 0**, go IDLE.
- When **HP < 30%**, go IDLE.
- When **HP >= 30%**, switch to TRAINING state.
- When **NPC HP <= 0**, NPC DIES.

Main NPC State Transition Diagram

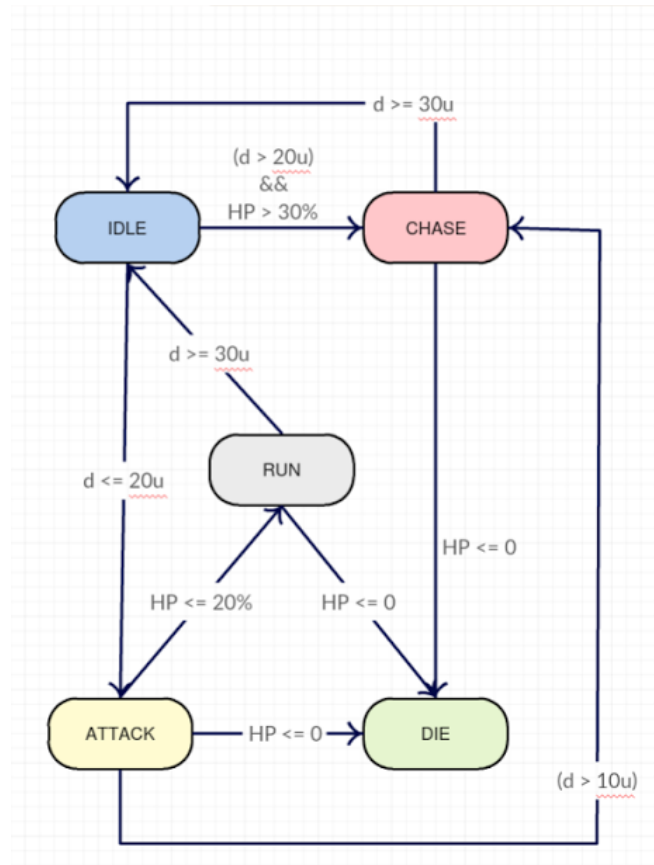


FSM # 2(Aggressive Creep)States**d = distance, HP = health points**

- When idle && (d <= 20u), **ATTACK** player.
- When attacking && (HP <= 20%), chance of **RUN**.
- When attacking && (d >= 10u), **CHASE** player.
- When chasing && (d >= 30u), go **IDLE**.
- When running && (d >= 30u), go **IDLE**.
- When (HP <= 0), **DIES**.

Conditions**d = distance, HP = health points**

- When **IDLE** && (**D <= 20U**), attack player.
- When **ATTACKING** && (**HP <= 20%**), chance of run.
- When **ATTACKING** && (**D >= 10U**), chase player.
- When **CHASING** && (**D >= 30U**), go idle.
- When **RUNNING** && (**D >= 30U**), go idle.
- When (**HP <= 0**), dies.

Aggressive Creep State Transition Diagram

Legend: d = distance, HP = health points

FSM # 3(Passive Creep)States

- While no one is Interacting with it, it is **IDLE**
- Upon being attacked, it **ATTACKS**
- When attacking target runs and is not in critical health ($20u > d > 10u$, $HP > 30\%$), it will **GIVE CHASE**
- Upon hitting critical health levels ($HP < 30\%$), it will try to **ESCAPE**
- Should the target escape ($d > 21u$), it will become **IDLE**
- Should it run away ($d > 21u$), it will **HEAL ITSELF**
- When it successfully Heals itself (Heal + $HP > 60\%$), it will become **IDLE**
- Should at any point its health goes below 0 ($HP < 0\%$), it will **DIE**

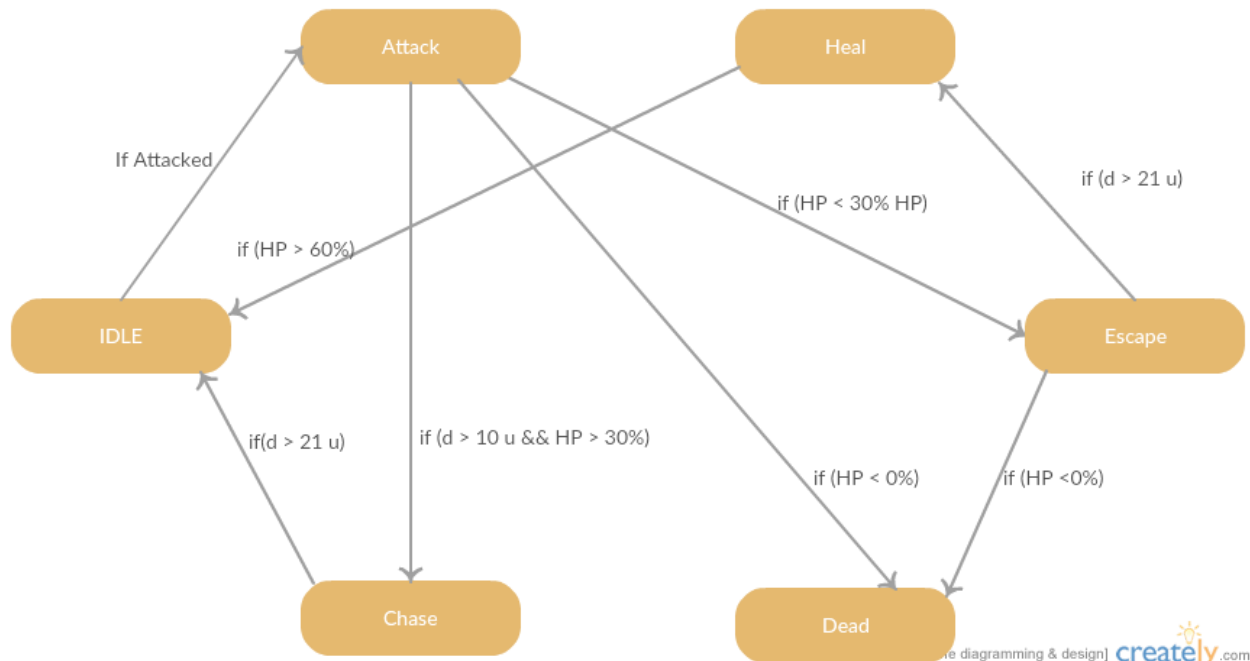
Legend: d = distance, HP = Health Points

Conditions

- While **no one is Interacting** with it, it is IDLE
- Upon being **attacked**, it ATTACKS
- When **attacking target runs** and is **not in critical health ($20u > d > 10u$, $HP > 30\%$)**, it will GIVE CHASE
- Upon hitting **critical health levels ($HP < 30\%$)**, it will try to ESCAPE
- Should the **target escape ($d > 21u$)**, it will become IDLE
- Should it **run away ($d > 21u$)**, it will HEAL ITSELF
- When it **successfully Heals itself (Heal + $HP > 60\%$)**, it will become IDLE.
- Should at any point its **health goes below 0 ($HP < 0\%$)**, it will DIE

Passive Creep State Transition Diagram

Legend: d = distance, HP = Health Points



FSM # 4 (Resource Creep)States

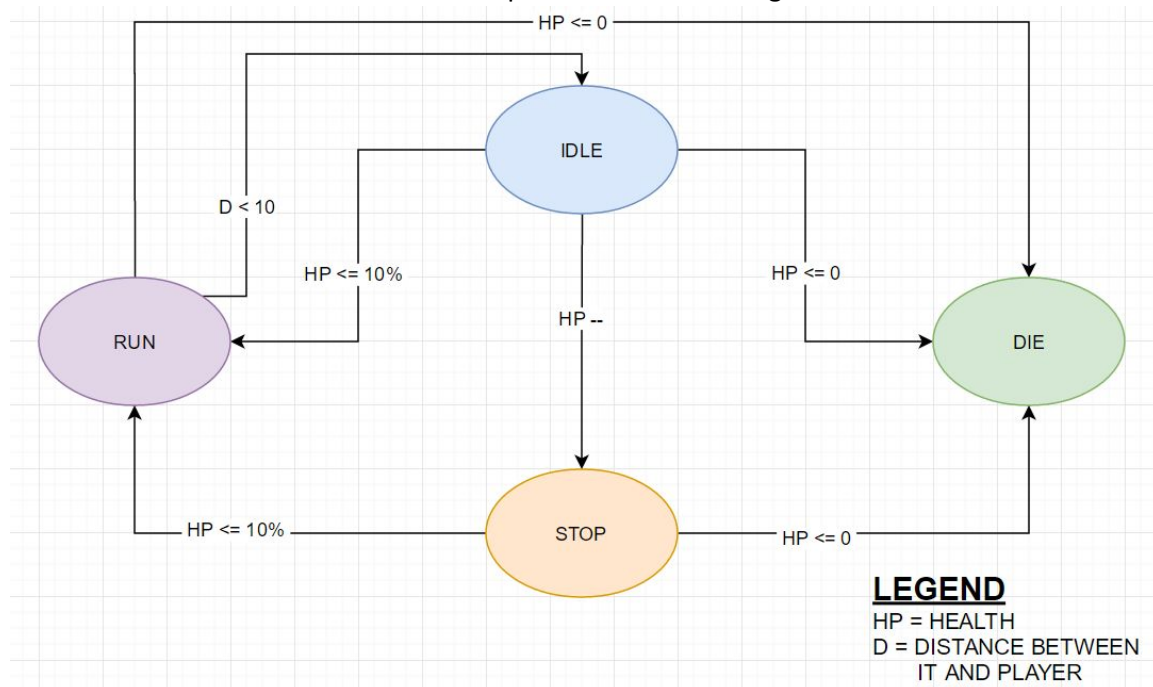
- When no one is interacting with itself, it is **IDLE**
- When it is attacked, it **STOPS**.
- When $HP < 10\%$, it **RUNS**.
- When $d > 10u$, it returns to **IDLE**
- Upon reducing its health to zero ($HP \leq 0\%$), it **DIES**

Legend: d = distance , HP = Health Points

Conditions

- When **no one is interacting with itself**, it is IDLE
- When **it is attacked**, it STOPS.
- When **HP < 10%**, it RUNS.
- When **d > 10u**, it returns to IDLE
- Upon reducing its health to zero (**HP <= 0%**), it DIES

Resource Creep State Transition Diagram

Additional Information

The main “protagonist” of this game scene is given the title NPC as **THERE WILL BE NO USER INPUT THROUGHOUT THE DURATION OF THE DEMO** to demonstrate Artificial Intelligence.

Nathan will be doing Passive and Aggressive creeps whereas Quan Wah will be doing Main NPC and resource creep.