Intercept coordination

Intercept coordination is required in two defcon situations:

1. Our ball free
2. Opponent ball free

The following defcon situation definitions are assumed:

1. Our ball free: the fastest robot can intercept, even if the fastest is a defender, without compromising the defense.
2. Opponent ball free: The opponent can intercept the ball faster than we can. It is up to the strategy to decide which robot should go to the ball.

Our ball free

The following solutions are considered:

1. Let each robot calculate the fastest interceptor, if the robot is the fastest, he will become interceptor.
   Problems:
   1. Fast switching between two different interceptors is not prevented
   2. Two robots think that they are the fastest: two interceptors
   3. Two robots think of each other that the other is the fastest: no one will intercept
2. Let each robot calculate the fastest interceptor, if the robot is the fastest, he will become interceptor. The interceptor can only change if the new interceptor is more than 0.Xs faster than the current one to prevent interceptor switching. The AM is used as backup; if no turtle is intercepting it will intercepting
   Problems:
   1. Two fast interceptors might be overruled by the AM which is far away because the two fast interceptors cannot agree upon which is really the fastest (so backup is used)
   2. Different robots calculate different time to intercepts because of communication delay, hence the hysteresis might not be effective
3. Let each robot calculate the fastest interceptor, and communicate the turtleID of the fastest. A new faster interceptor is only selected when it is more than 0.Xs faster than the current one to prevent interceptor switching. The interceptor selected by the turtle with the lowest ID will intercept the ball. The AM can still intercept if no other turtle is intercepting.
   Problems:
   1. We rely on fast communication (which does not have to be a real problem because on recent tournaments the communication is very good)

Option 3 will be implemented.

Opponent ball free

Only the attacker main and attacker assist will intercept the ball. The following solution is proposed:

1. The attacker assist calculates the intercept time for the AM and for the AA. If the AA is 0.Xs faster than the AM, it will take-over the intercept. It continues intercepting the ball until the AM is 0.Xs faster, then it will stop intercepting. The AM checks if the AA is intercepting, if not it will start intercepting the ball.

Implementation note: To make the code easier, the behavior of the AM can be the same for Our ball free and Opponent ball free: Intercept always if no other turtle is intercepting.