



ROBOCODE

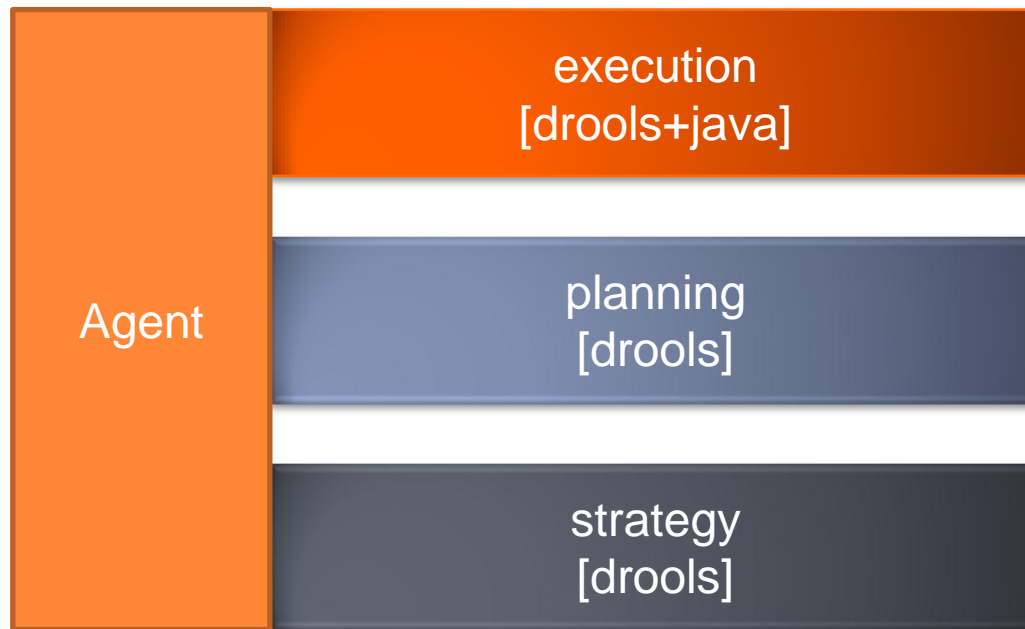
Agentes Cognitivos e Adaptativos
Adônis, Cleunio, Túlio

TODAY'S TALK

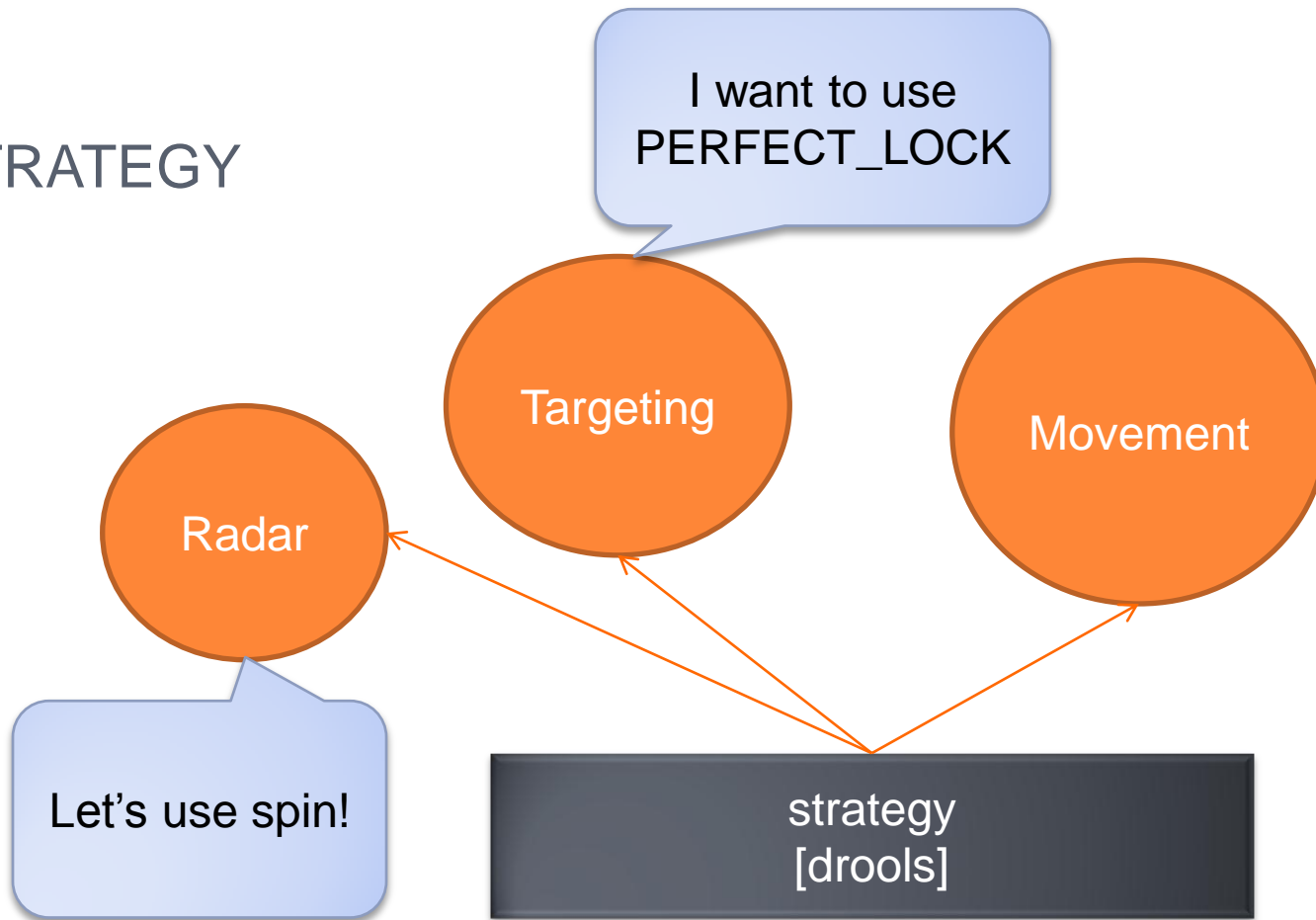
- agent structure
- strategies
 - communication
 - rules
- final words



AGENT STRUCTURE



STRATEGY



IN RULES

```
rule "Choose starting strategy"  
when  
    $strategy : Strategy (initialized == false);  
    $robot : Robotonikku(strategy == $strategy);  
then  
    $strategy.setCurrentTarget(Strategy.TargetingStrategy.HEAD_ON);  
    $strategy.setCurrentMovement(Strategy.MovementStrategy.ANTI_GRAVITY);  
    $strategy.setCurrentRadar(Strategy.RadarStrategy.SPIN);  
    $strategy.init();  
  
    Message msg = new Message(Message.STRATEGY, $strategy);  
    insert(msg);  
  
    update($strategy);  
    System.out.println( "Strategy initialization: Default parameters" );  
end
```



IN RULES

```
rule "Anti Gravity Movement"  
when  
    $action : Action(type == Action.ActionType.DO_NOTHING);  
    $strategy : Strategy (movement == Strategy.MovementStrategy.ANTI_GRAVITY);  
    $robot : Robotonikku(action == $action, state == Robotonikku.RobotState.IDDLE, strategy  
== $strategy, $position : position);  
then  
    Point $force = $robot.getAntiGravityForce();  
  
    $robot.setState(Robotonikku.RobotState.LOOKING_FOR_TARGET);  
  
    $action.setType(Action.ActionType.MOVING);  
    $action.setDestination($position.x + $force.x, $position.y + $force.y);  
  
    update($action);  
    update($robot);  
end
```



COMMUNICATION

planning
[drools]

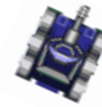
I've found
an enemy!



I've found
nothing, I'll go
with you



I am already
attacking
someone!



COMMUNICATION

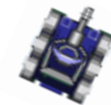


planning
[drooms]

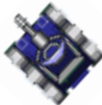
I use SPIN
RADAR



I use SPIN
RADAR



I use
PERFECT_LOCK,
should I change?



COMMUNICATION

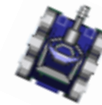


planning
[drooms]

Hum... I was
using that too,
should I
change?



I've died with
SPIN radar.



STRATEGY

execution
[drools+java]

Ok, there is my
enemy! I should
target him and
shoot!



IN RULES

```
rule "No Victim and message received" salience 20
when
    not (exists Victim())
    $message : Message()
    $status: EstadoRobot()
then
    Victim victim = new Victim();
    victim.setName($message.getVictimName());
    victim.setX($message.getVictimX());
    victim.setY($message.getVictimY());
    double $distance = Auxiliar.distancia($status.getX(), $status.getY(), $message.getVictimX(),
$message.getVictimY());
    victim.setDistancia($distance);

    double $absAngle = Auxiliar.anguloAbsoluto($status.getX(), $status.getY(),
$message.getVictimX(), $message.getVictimY());
    double $tankRotation = Auxiliar.anguloRelativo($status.getHeading(), $absAngle);
    insert(new Action(Action.ActionType.TURN_TANK_RIGHT, $tankRotation, 3));
    double $gunRotation = Auxiliar.anguloRelativo($status.getGunHeading(), $absAngle);
    insert(new Action(Action.ActionType.TURN_CANON_RIGHT, $gunRotation, 3));

    insert(victim);
    victim.setAttackAngle($absAngle);

    #insert(new Action(Action.ActionType.MOVE_FORWARD, $distance, 2));
end
```



IN RULES

rule "No Victim, get the one scanned"

when

```
    not (exists Victim())
    $victim: ScannedRobotEvent()
    $status: EstadoRobot()
```

then

```
    Victim victim = new Victim();
    double anguloAbsoluto = Auxiliar.anguloAbsoluto($status.getHeading(), $victim.getBearing());
    victim.setName($victim.getName());
    victim.setX(Auxiliar.calcularX($status.getX(), anguloAbsoluto, $victim.getDistance()));
    victim.setY(Auxiliar.calcularY($status.getY(), anguloAbsoluto, $victim.getDistance()));
    victim.setDistancia($victim.getDistance());
    insert(victim);

    insert(new Action(Action.ActionType.TURN_TANK_RIGHT, $victim.getBearing(), 1));
    double anguloRelativoCanon = Auxiliar.anguloRelativo($status.getHeading(), $status.getGunHeading());
    insert(new Action(Action.ActionType.TURN_CANON_RIGHT, ($victim.getBearing() - anguloRelativoCanon), 1));
    double anguloRelativoRadar = Auxiliar.anguloRelativo($status.getHeading(), $status.getRadarHeading());
    insert(new Action(Action.ActionType.TURN_RADAR_RIGHT, ($victim.getBearing() - anguloRelativoRadar), 1));
    insert(new Action(Action.ActionType.MOVE_FORWARD, ($victim.getDistance()-100), 1));

    Message message = new Message();
    message.setVictimX(victim.getX());
    message.setVictimY(victim.getY());
    message.setVictimName(victim.getNombre());

    insert(message);
```

end



FINAL WORDS

drools, robocode

pros

- easy to think strategies in terms of rules
- syntax easy to learn
- nicely integrated with java

cons

- very few sample codes (only 1 actually)
- too much time as first timers
 - security
 - class loaders (real problem)
- tools
- communication is not that easy (serializable)
- conflict solving
 - friendly fire
 - collisions





ROBOCODE

Agentes Cognitivos e Adaptativos
Adônis, Cleunio, Túlio