Towards automatic StarCraft strategy generation using genetic programming

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Who are we?
Why do we deserve the prize?
Videogames are cool
GP is cool
What did we know about Starcraft before?
Well, Alberto played half-campaign in the 2000s
Then again, why StarCraft?
It’s the testbed in RTS AI research
And what did we do?
What does our generated code do?
We don’t know
```cpp
void ZergEvolvedStrategy::computeActions()
{
    computeActionsBase();

    noWorkers = AgentManager::getInstance()->countNoBases() + 
               AgentManager::getInstance()->countNoUnits(UnitTypes::Zerg_Extractor);  
    int cSupply = Broodwar->self()->supplyUsed() / 2;
    int min = Broodwar->self()->minerals();
    int gas = Broodwar->self()->gas();

    // due to the evolution process, stage can be lower than 0 or bigger than 10
    // for this reason, here we assure that the variable is within the thresholds
    if (stage < 0 ) stage = 0;
    if (stage > 10 ) stage = 10;

    // start of a rule
    if (stage == 6 || AgentManager::getInstance()->countNoFinishedUnits(UnitTypes::Zerg_Nydus_Canal) > 0
        || min > 476 && gas > 432 && cSupply > 805
        || !Broodwar->enemy()->getRace().getID() == Races::Protoss.getID() )
    {
        buildplan.push_back(BuildplanEntry(TechTypes::Ensnare, 14));
        stage == -1;
    }
    // end of a rule

    // start of a rule
    if (stage == 4 || AgentManager::getInstance()->countNoFinishedUnits(UnitTypes::Zerg_Evolution_Chamber) > 0
        || min > 752 && gas > 69 && cSupply > 493
        || Broodwar->enemy()->getRace().getID() == Races::Zerg.getID() )
    {
        buildplan.push_back(BuildplanEntry(UpgTypes::Zerg_Melee_Attacks, 1));
        if (squad.size() > 8)
            if (squad.size() > SQUAD_LIMIT) squad.size() -> addSetup(UnitTypes::Zerg_Scourage, 1);  
            buildplan.push_back(BuildplanEntry(UpgTypes::Zerg_Missile_Attacks, 20));
        // REST OF ACTIONS
        buildplan.push_back(BuildplanEntry(UnitTypes::Zerg_Queens_Nest, 10));
        if (squad.size() > 8)
            if (squad.size() > SQUAD_LIMIT) squad.size() -> addSetup(UnitTypes::Zerg_Queen, 1);
        if (squad.size() > 5)
            if (squad.size() > SQUAD_LIMIT) squad.size() -> addSetup(UnitTypes::Zerg_Zergling, 1);
        if (squad.size() > 1) squad.size() -> setMorphsTo(UnitTypes::Zerg_Lurker);
        stage == 0;
    }
    // REST OF RULES
```
Why is it “Human Competitive”?
It cannot win vs. humans

Well, actually no AI can beat humans in Starcraft (yet)
However...
It can beat several human-made techniques
And, it can beat the human-made bot used as baseline
And, thanks to this work...
We created an international group focused on Computational Intelligence in Games

(see our awesome paper on Hearthstone in the CIG conference!)
Thanks!