### <<trait>> Alaorithm

types: AgentId, Action, NeighborMetadata, SignalType, UtilityType, State <: StateType

# <<trait>> StateType

id: AgentId

centralVariableValue: Action

domain: Set[Action]

neighborActions: Map[AgentId, Action]

withCentralVariableAssignment(value: Action): this.type

withUpdatedNeighborActions(newNeighborActions: Map[AgentId, Action]): this.type

computeExpectedNumberOfConflicts: Int

updateNeighborhood(n: Map[AgentId, Any]): this.type

createInitialState(id: AgentId, action: Action, domain: Set[Action]): State

createVertex(id: AgentId, initialAction: Action, domain: Set[Action]): Vertex[AgentId, State, Any, Any]

createEdge(targetId: AgentId): Edge[AgentId]

shouldConsiderMove(c: State):Action computeMove(c: State): Action isInLocalOptimum(c: State): Boolean shouldTerminate(c: State): Boolean

computeExpectedUtilities(c: State): Map[Action, UtilityType]

updateMemory(c: State): State computeUtility(c: State): UtilityType

#### <<tr><<trait>> StateModule

types: State <: StateInterface

# <<tr><<trait>> StateInterface extends StateType

id: AgentId

centralVariableValue: Action

domain: Set[Action]

neighborActions: Map[AgentId, Action]

withCentralVariableAssignment(value: Action): this.type withUpdatedNeighborActions(newNeighborActions:

Map[AgentId, Action]): this.type

computeExpectedNumberOfConflicts: Int

updateNeighborhood(n: Map[AgentId, Any]): this.type

createInitialState(id: AgentId, action: Action, domain:

Set[Action]): State

# <<tr>AdjustmentSchedule

shouldConsiderMove(c: State):Action

#### <<tr>> DecisionRule

computeMove(c: State): Action isInLocalOptimum(c: State): Boolean

isInLocalOptimumGivenUtilitiesAndMaxUtility(c: State,

expectedUtilities: Map[Action, Double].

maxUtility: Double): Boolean

#### <<tr><<trait>>> TerminationRule

shouldTerminate(c: State): Boolean

### <<trait>> TargetFunction

computeCandidates(c: State): Set[State]

computeExpectedUtilities(c: State): Map[Action, UtilityType]

updateMemory(c: State): State

## <<tr>it>> Utility

computeUtility(c: State): UtilityType

## <<trait>> SianalCollectAlaorithmBridae

createVertex(id: AgentId, initialAction: Action, domain:

Set[Action]): Vertex[AgentId, State, Any, Any]

createEdge(targetId: AgentId): DcopEdge

### DcopVertex extends DataGraphVertex [AgentId, State]

id: AgentId initialState: State

changeMove(c: State): State

collect: State updatedState: State

isConverged(c: State): Boolean

isStateUnchanged(oldState: State): Boolean

scoreSignal: Double

## DcopEdge extends DefaultEdge [Id]

type Source = DcopVertex

signal: Action