



RPG MODELING WITH HENSHIN

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An assignment of the Model Driven Engineering course

Contents

- Introduction
- Role Playing Game modeling with Henshin
- Role Playing Game to PetriNet modeling with Henshin
- Comparison with AToMPM and conclusion

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AToMPM*

- A Tool for Multi-Paradigm Modeling
 - Research framework
 - Domain-specific modeling tools
 - Web-based
 - Model Driven Engineering



AToMPM

*Prof. Dr. Eugene Syriani, Prof. Dr. Hans Vangheluwe, 2013. A tool for multi-paradigm modeling (AToMPM). <http://syriani.cs.ua.edu/atomp/atomp.htm>.

Henshin*

- Model transformation language
- Built on the Eclipse Modeling Framework
- Endogenous and exogenous transformations



Palette

Objects

- EPackage
- EClass
- EDataType
- EEnum
- EAnnotation
- EOperation
- EAttribute
- EEnumLiteral
- Details Entry

Connections

- EReference
- Inheritance
- EAnnotation link

Palette

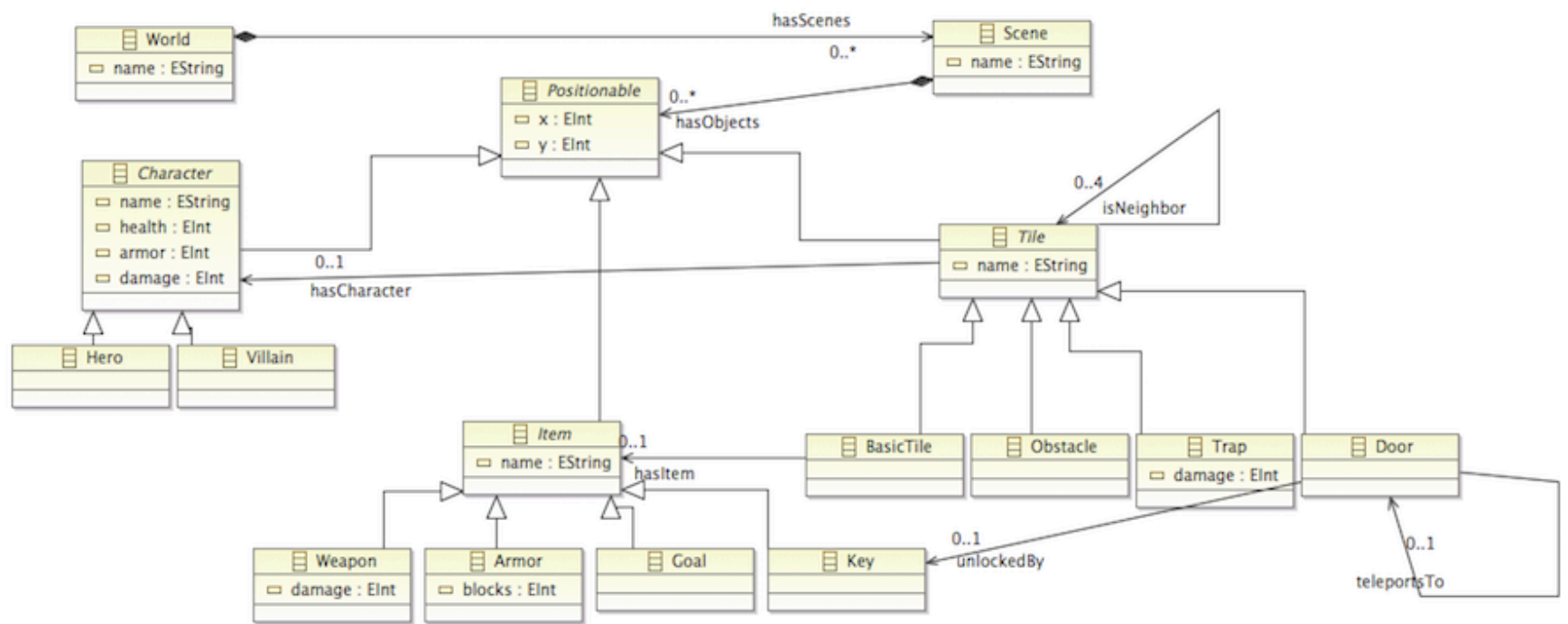
- Rule
- Node
- Edge
- Attribute
- Unit
- Invocation
- RPG
 - Armor
 - BasicTile
 - Character
 - Door
 - Goal
 - Hero
 - Item
 - Key
 - Obstacle
 - Positionable
 - Scene
 - Tile
 - Trap
 - Villain
 - Weapon
 - World

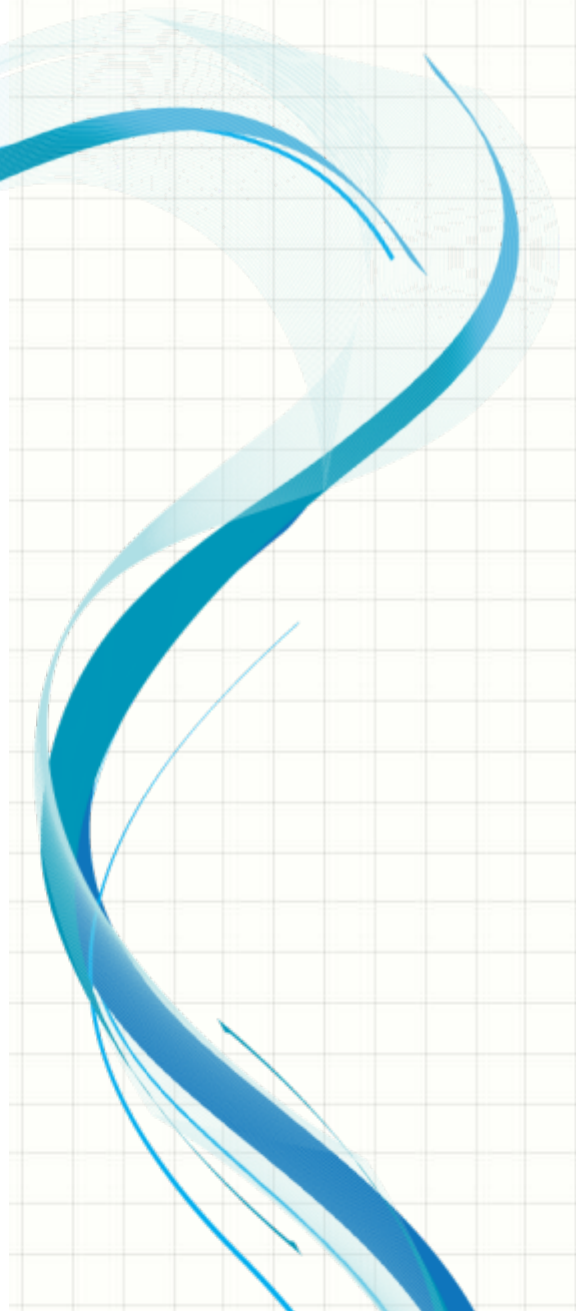
Create a Character node

- Eclipse Modeling Framework
 - Ecore Model
 - EMF Generator Model
 - EMF Project
 - Empty EMF Project
 - Mapping
- Ecore Tools
 - Ecore Diagram
 - Ecore Tools Project
- Example EMF Model Creation Wizards
- Git
- Henshin
 - Henshin Diagram
 - Henshin Model
 - Henshin State Space

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Resource Set

platform:/resource/Henshin/src/RPG.henshin

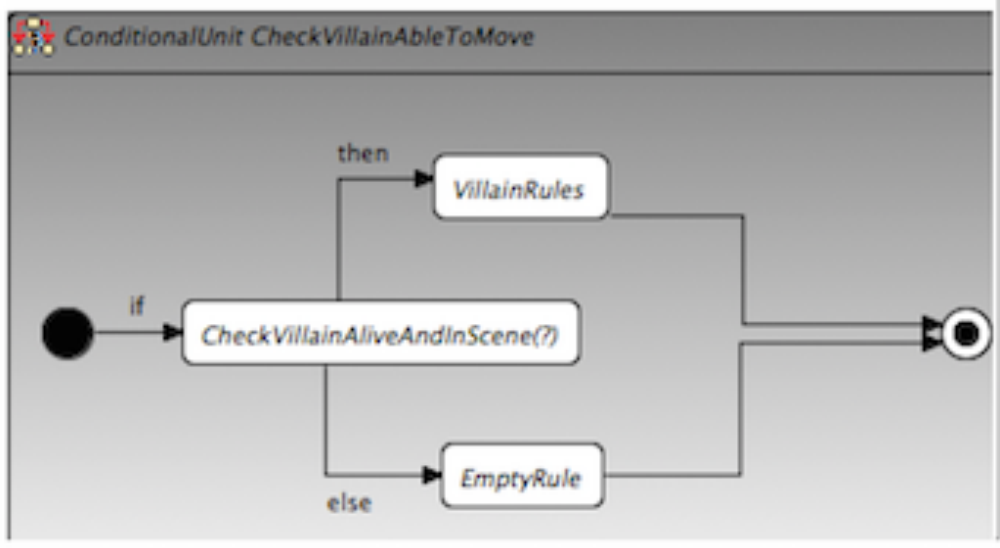
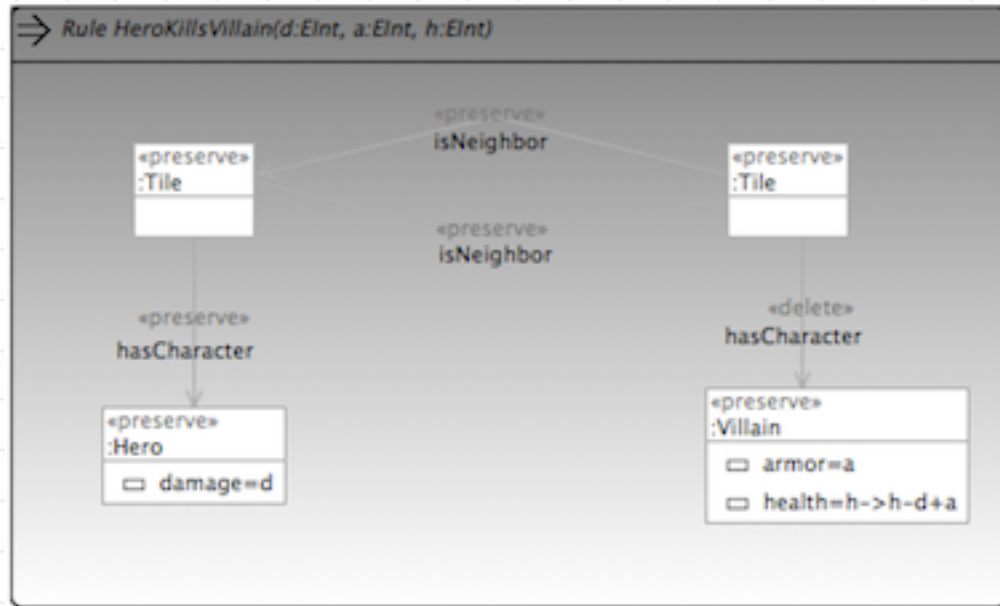
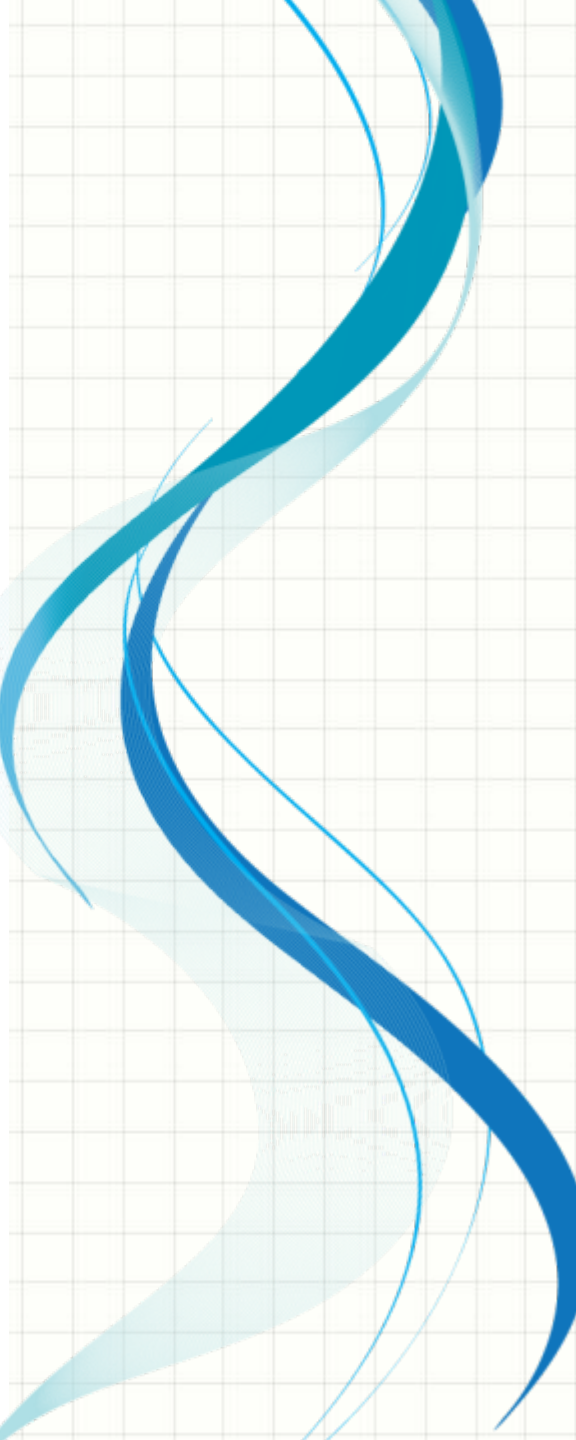
Module RPG

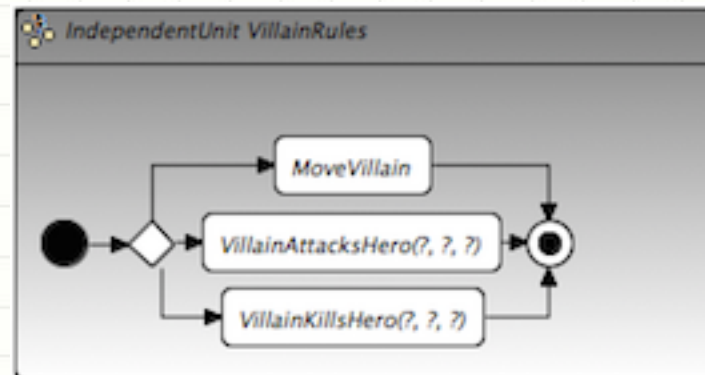
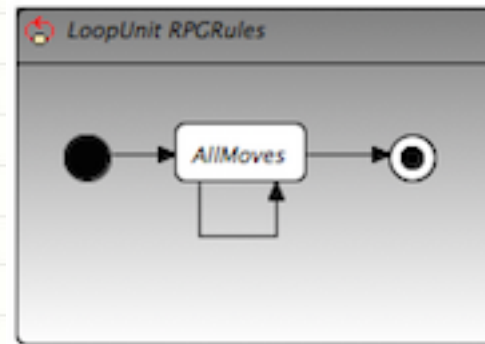
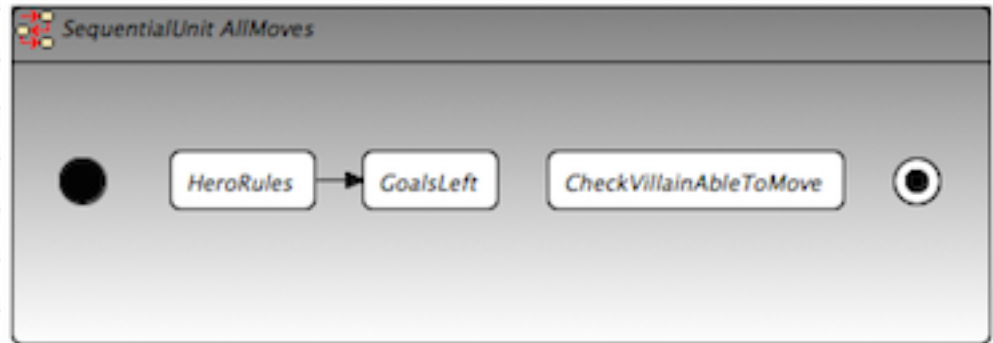
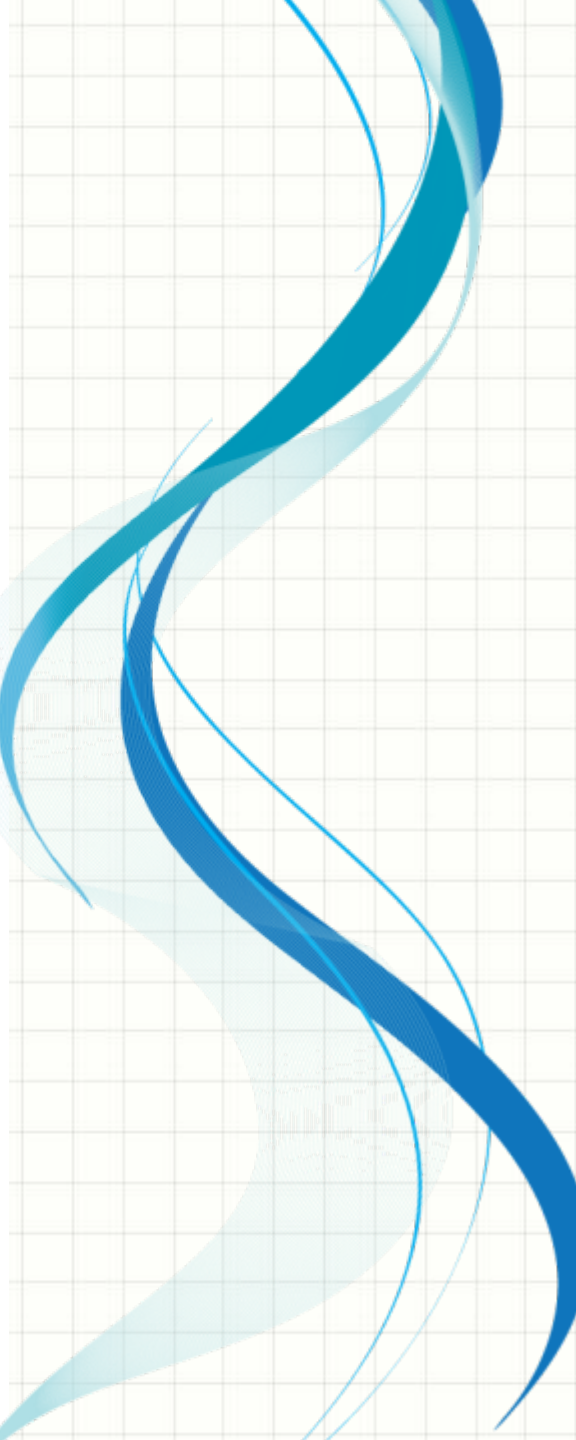
- Rule MoveHero
- Rule MoveVillain
- Rule MoveHeroToTrap(h:Elnt, d:Elnt)
- Rule MoveHeroToTrapAndDie(h:Elnt, d:Elnt)
- Rule HeroTakeArmor(a:Elnt, b:Elnt)
- Rule HeroTakeWeapon(d:Elnt, w:Elnt)
- Rule HeroTakeGoal
- Rule MoveHeroToDoor
- Rule MoveHeroThroughDoor
- Rule HeroTakeKey
- Rule HeroAttacksVillain(d:Elnt, a:Elnt, h:Elnt)
- Rule HeroKillsVillain(d:Elnt, a:Elnt, h:Elnt)
- Rule VillainAttacksHero(d:Elnt, a:Elnt, h:Elnt)
- Rule VillainKillsHero(d:Elnt, a:Elnt, h:Elnt)
- Rule GoalsLeft
- Rule CheckVillainAliveAndInScene(h:Elnt)
- Rule EmptyRule
- IndependentUnit HeroRules
- IndependentUnit VillainRules
- LoopUnit RPGRules
- SequentialUnit AllMoves
- ConditionalUnit CheckVillainAbleToMove

platform:/resource/Henshin/src/RPG.ecore

RPG

- World
- Scene
- Tile -> Positionable
- BasicTile -> Tile
- Obstacle -> Tile
- Trap -> Tile
- Door -> Tile
- Positionable
- Character -> Positionable
- Hero -> Character
- Villain -> Character
- Item -> Positionable
- Weapon -> Item
- Armor -> Item
- Goal -> Item
- Key -> Item





Preview

Model Comparison Parameters

Structure Compare

- > World RPG
 - > Scene Castle
 - > Basic Tile Castle11
 - Hero Perceval [hasCharacter set]
 - Goal WinningGoal [hasItem unset]
 - Goal WinningGoal [hasObjects delete]
 - > Scene Forest
 - Villain Kay
 - Basic Tile Forest11
 - Basic Tile Forest12
 - Basic Tile Forest21
 - Basic Tile Forest22
 - Basic Tile Forest23
 - Door Forest33

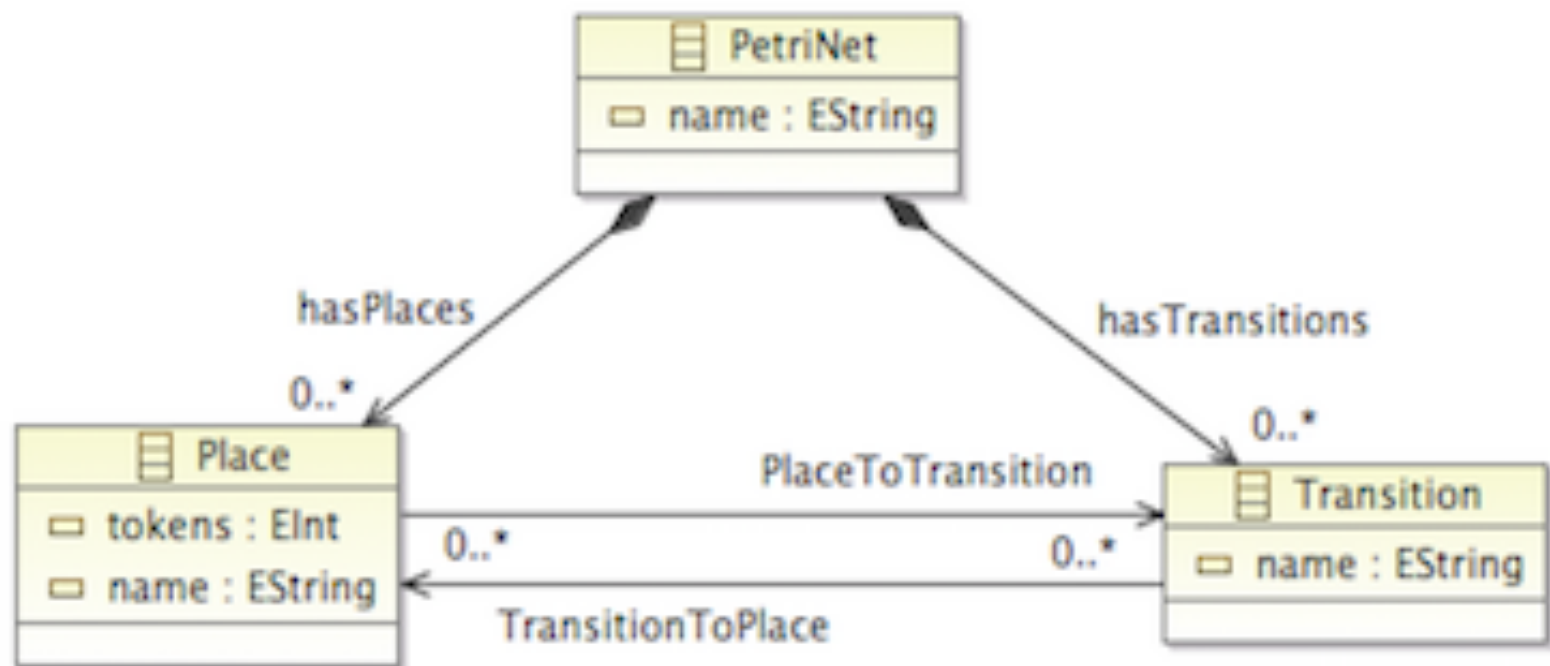
EMF Model Compare

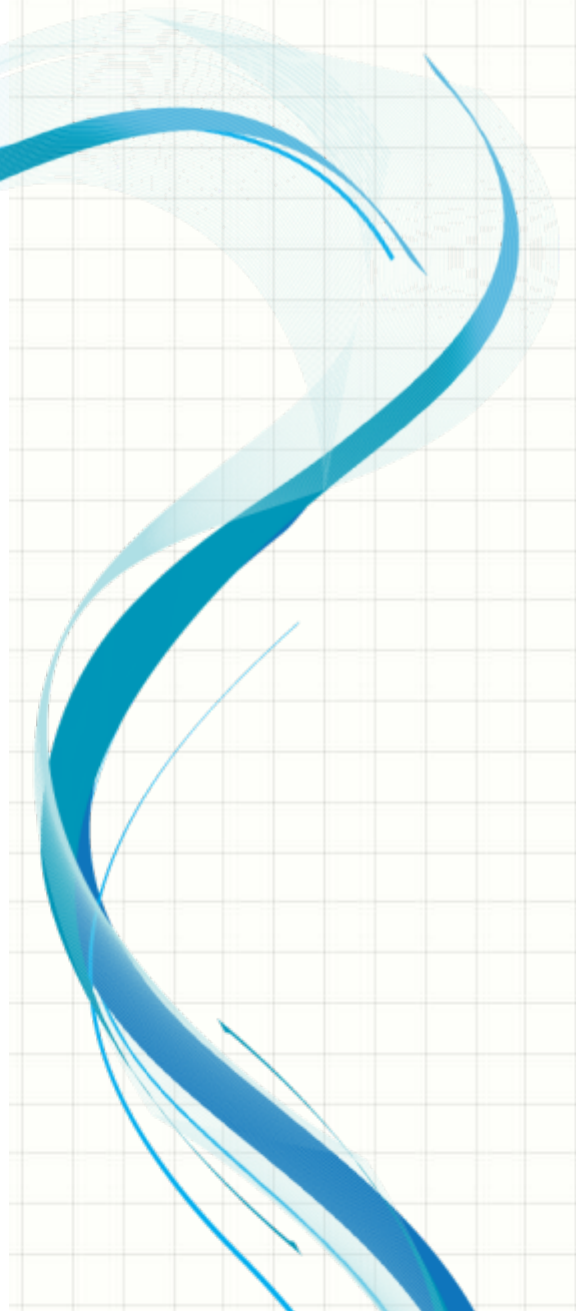
Transformed Model	Original Model
<ul style="list-style-type: none">> World RPG<ul style="list-style-type: none">> Scene Forest<ul style="list-style-type: none">Basic Tile Forest11Basic Tile Forest12Trap Forest13Basic Tile Forest21Basic Tile Forest22Basic Tile Forest23Trap Forest31Obstacle Forest32Door Forest33Hero PercevalVillain KayKey KeyDoorForestScene Castle	<ul style="list-style-type: none">> World RPG<ul style="list-style-type: none">> Scene Forest<ul style="list-style-type: none">Basic Tile Forest11Basic Tile Forest12Trap Forest13Basic Tile Forest21Basic Tile Forest22Basic Tile Forest23Trap Forest31Obstacle Forest32Door Forest33Hero PercevalVillain KayKey KeyDoorForestWeapon SwordArmor ShieldScene Castle

OK

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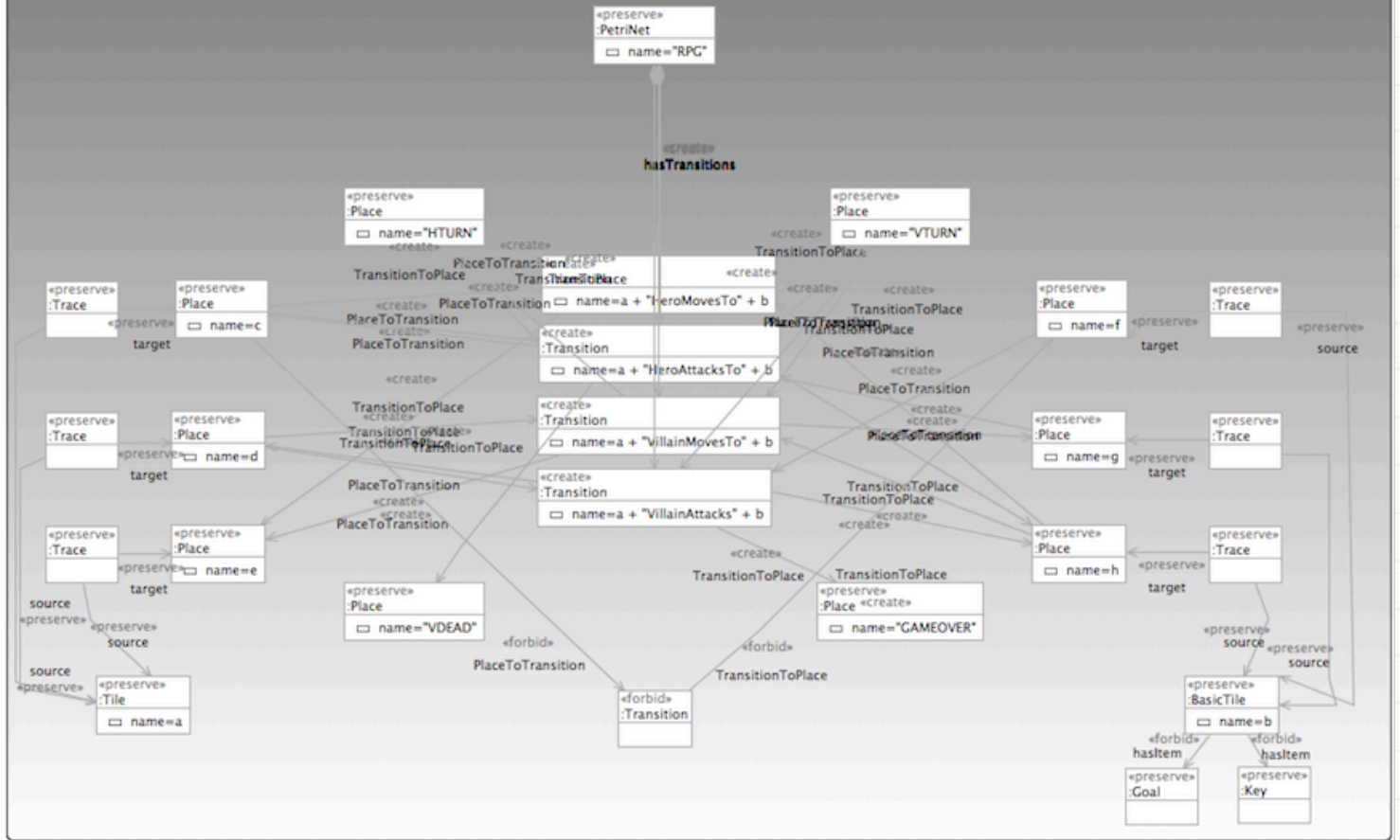


RPG2PetriNet.henshin

Resource Set

- platform:/resource/Henshin/src/RPG2PetriNet.henshin
 - Module
 - Rule InitPetriNet
 - Rule SetTrapPlaces(d:EString)
 - Rule SetDoorPlaces(d:EString)
 - Rule SetBasicPlaces(d:EString)
 - LoopUnit LoopSetPlaces
 - IndependentUnit SetPlaces
 - Rule SetKey(d:EString)
 - Rule SubstituteNormal(a:EString, b:EString, c:EString, d:EString, e:EString, f:EString, g:EString, h:EString)
- platform:/resource/Henshin/src/PetriNet.ecore
 - petrinet
 - Place
 - Transition
 - PetriNet
- platform:/resource/Henshin/src/RPG.ecore
 - RPG
 - World
 - Scene
 - Tile -> Positionable
 - BasicTile -> Tile
 - Obstacle -> Tile
 - Trap -> Tile
 - Door -> Tile
 - Positionable
 - Character -> Positionable
 - Hero -> Character
 - Villain -> Character
 - Item -> Positionable
 - Weapon -> Item
 - Armor -> Item
 - Goal -> Item
 - Key -> Item

⇒ Rule SubstituteNormal(a:EString, b:EString, c:EString, d:EString, e:EString, f:EString, g:EString, h:EString)



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My comparison

1

- AToMPM has a more appealing visual approach

2

- AToMPM has NAC, while Henshin only has forbid keyword

3

- Transformations in AToMPM are visual, while Henshin has textual-based transformations

4

- Deterministic (AToMPM) \leftrightarrow Non deterministic (Henshin)

My conclusion

- AToMPM has more visual capabilities than Henshin.
- AToMPM is more user friendly and uses more visual objects for modeling.
- Henshin is non deterministic, while AToMPM is deterministic.



QUESTIONS?