Österreichisches Forschungsinstitut für Artificial Intelligence

NECA
NET ENVIRONMENT FOR EMBODIED EMOTIONAL CONVERSATIONAL AGENTS

NECA
Architecture
Rich Representation
Language
&
more

Brigitte Krenn & Hannes Pirker

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Overview of Presentation

- **What** does NECA aim for?

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Overview of Presentation

- **What** does NECA aim for?
- **How** does it **work**?

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Overview of Presentation

- **What** does NECA aim for?
- **How** does it **work**?
  - Architecture
  - RRL
  - Gesticon

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What does NECA aim for?

- **NECA**
- Net Environments for Embodied Emotional Conversational Agents

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NECA Objectives

- Produce multi-user/ multi agent virtual spaces for the internet
- Populated by affective conversational agents
- which express themselves through emotional speech and non-verbal expression

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The NECA Platform

- Is a confederation of dedicated components.
- Is a basis for the implementation of various applications.
- Will be evaluated in two concrete application scenarios...

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eShowroom Scenario

Presenting through performing

Using animated presentation teams

Simulating sales talks

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Socalite: Flash based

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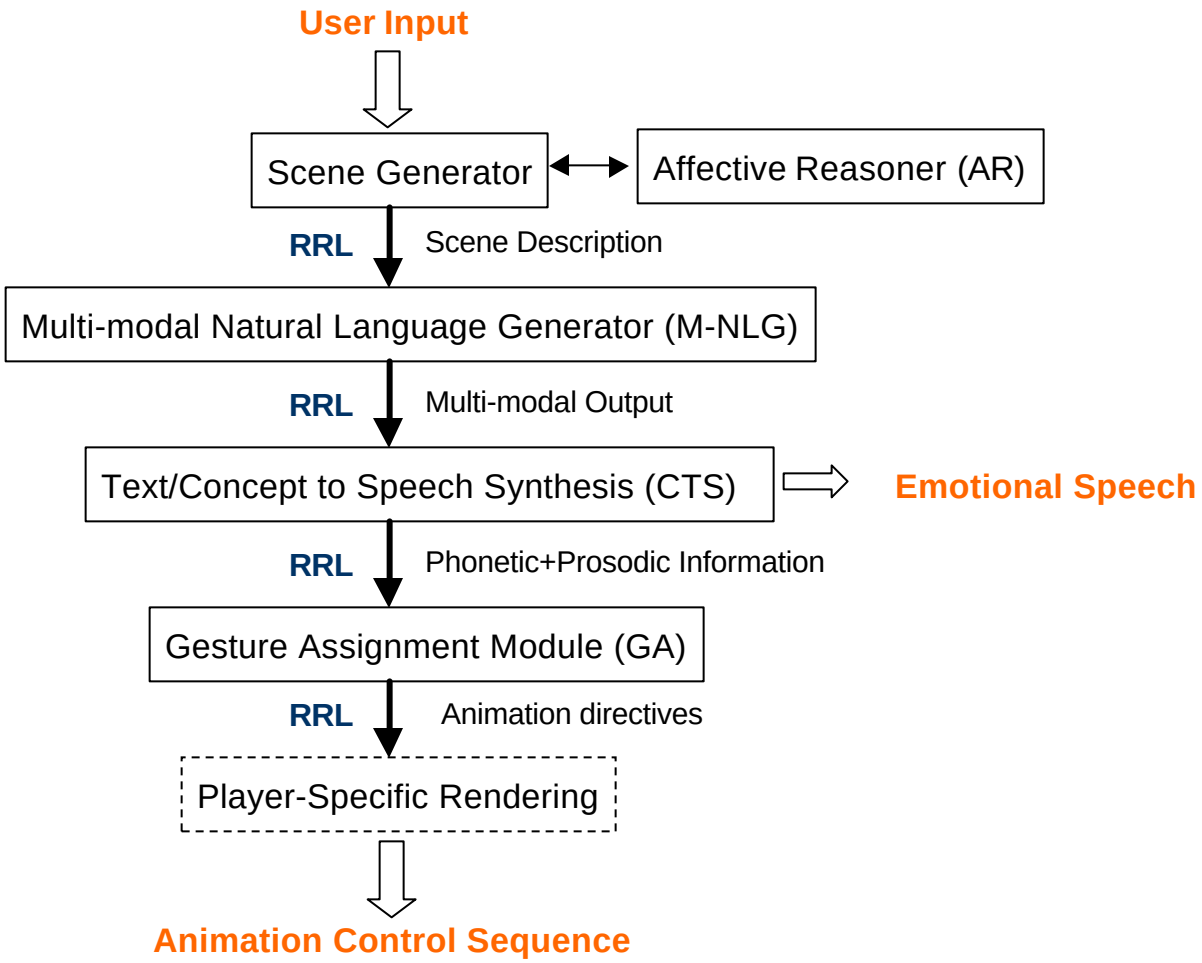
NECA Pipeline Architecture



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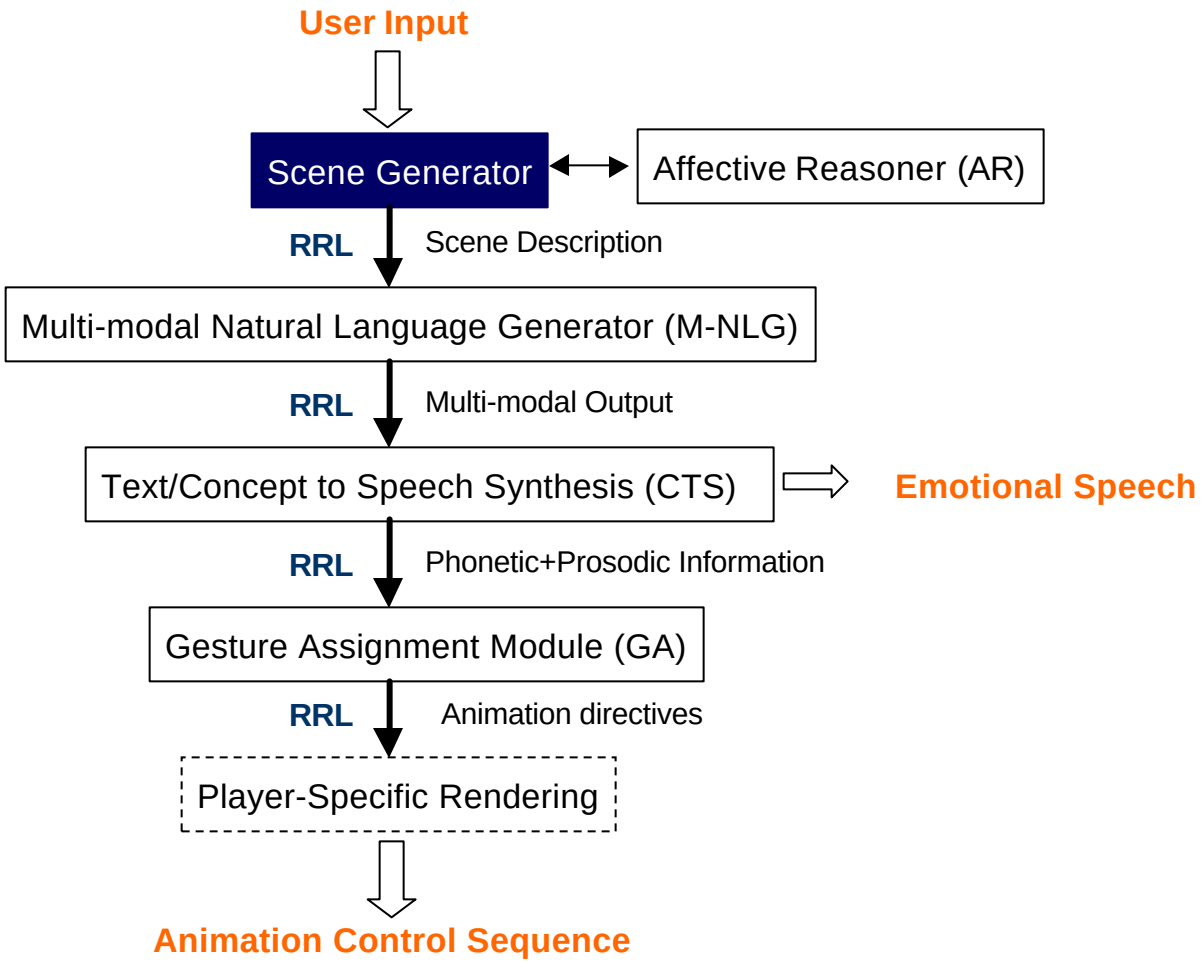
Scene Generator



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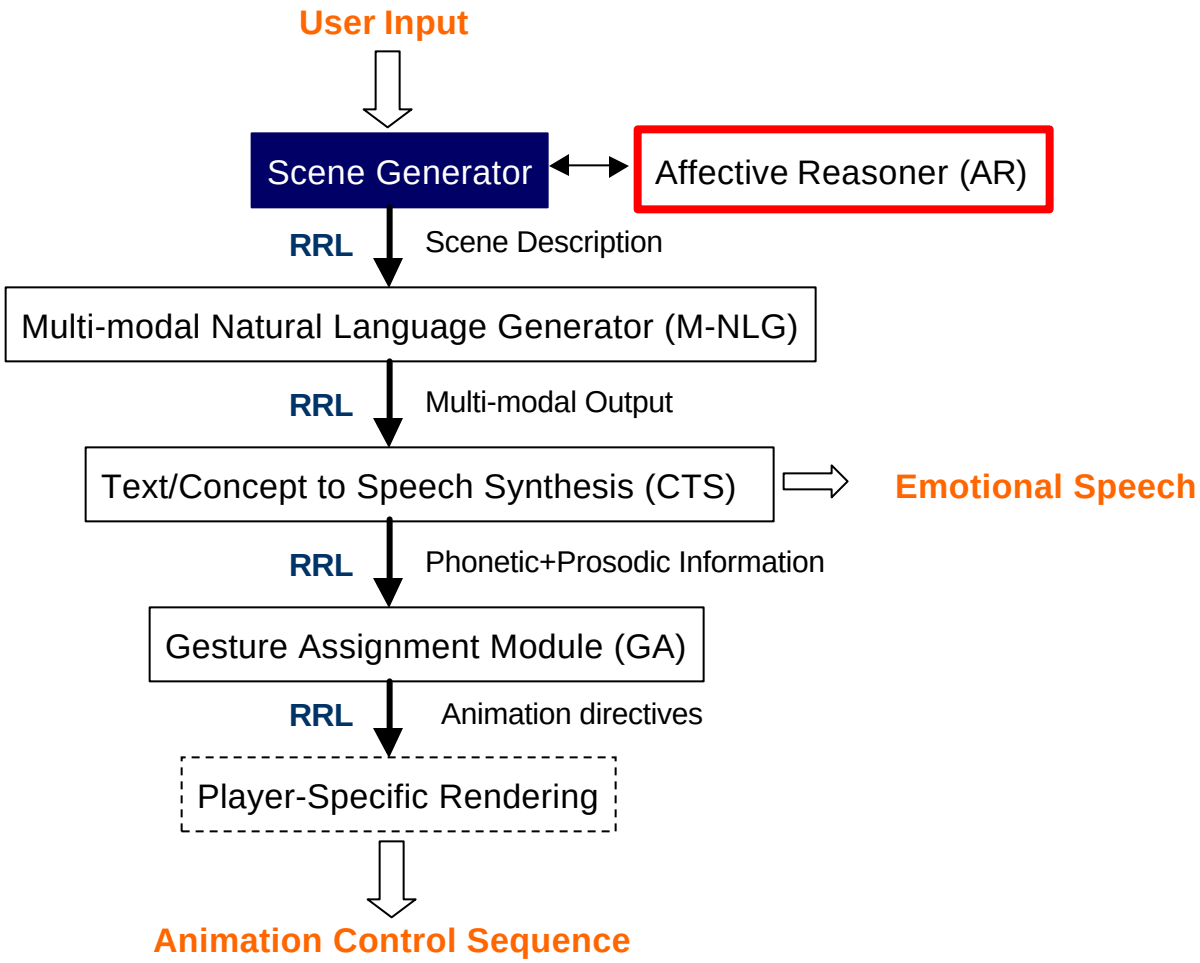
Affective Reasoner



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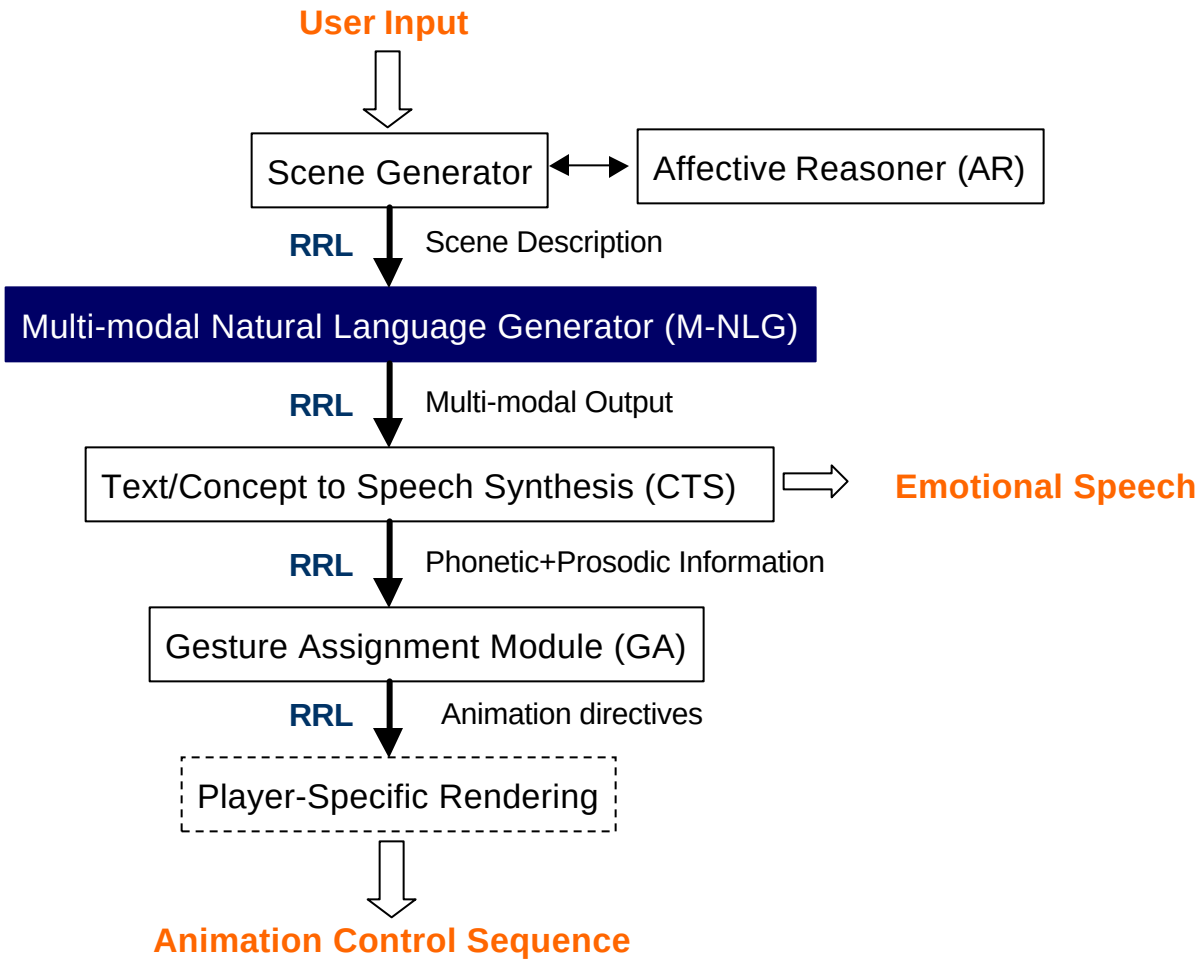
Multi-modal NLG



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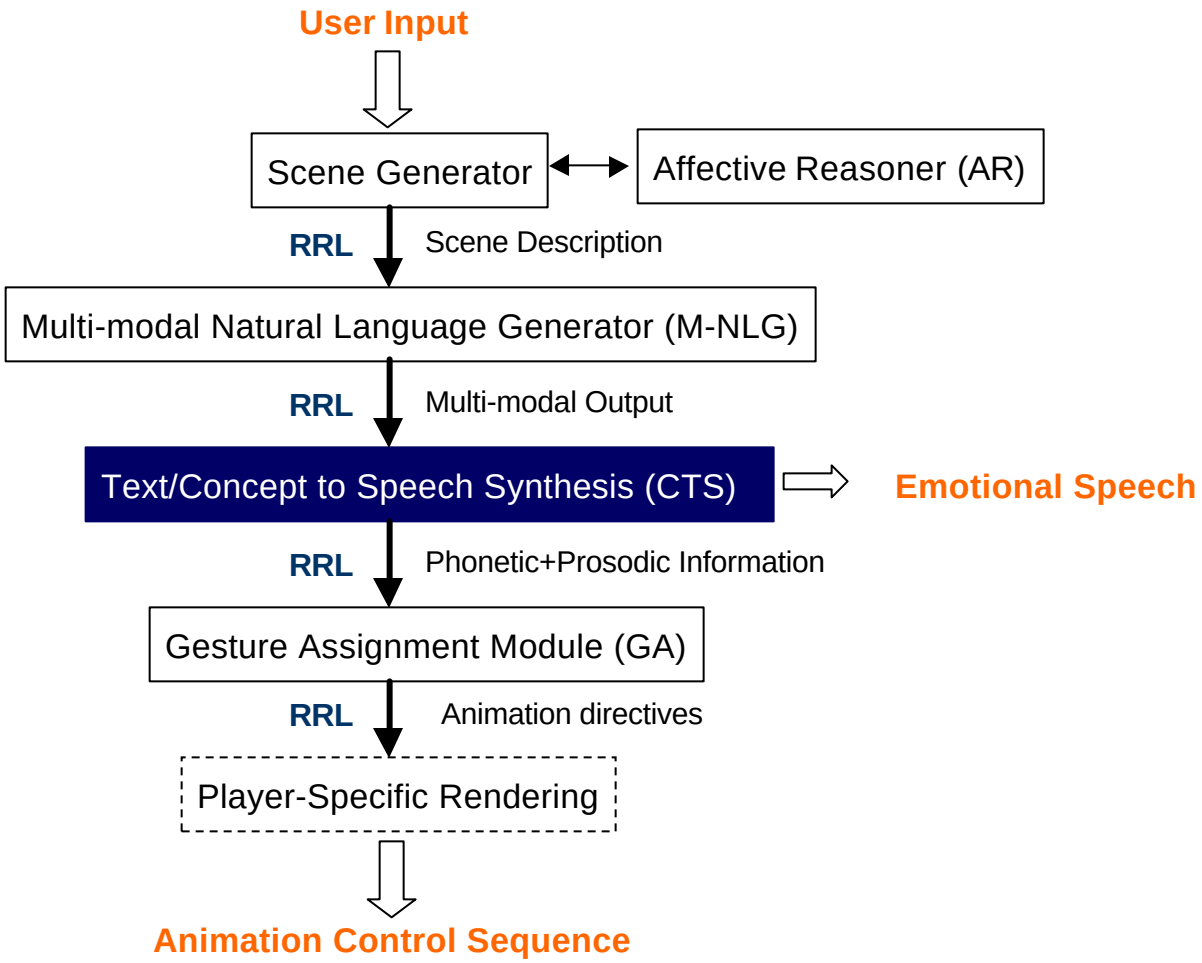
Text/Concept to Speech Synthesis



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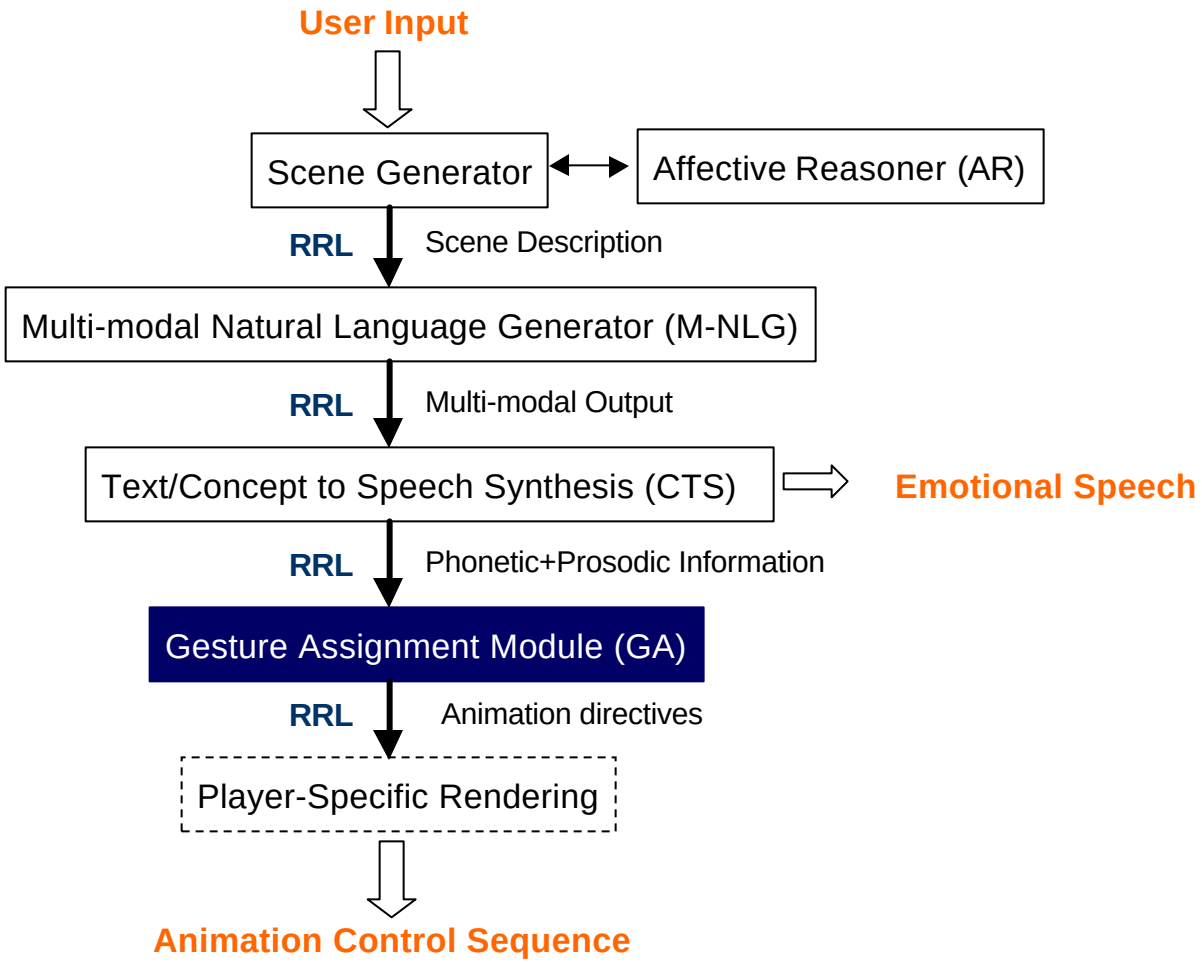
Gesture Assignment



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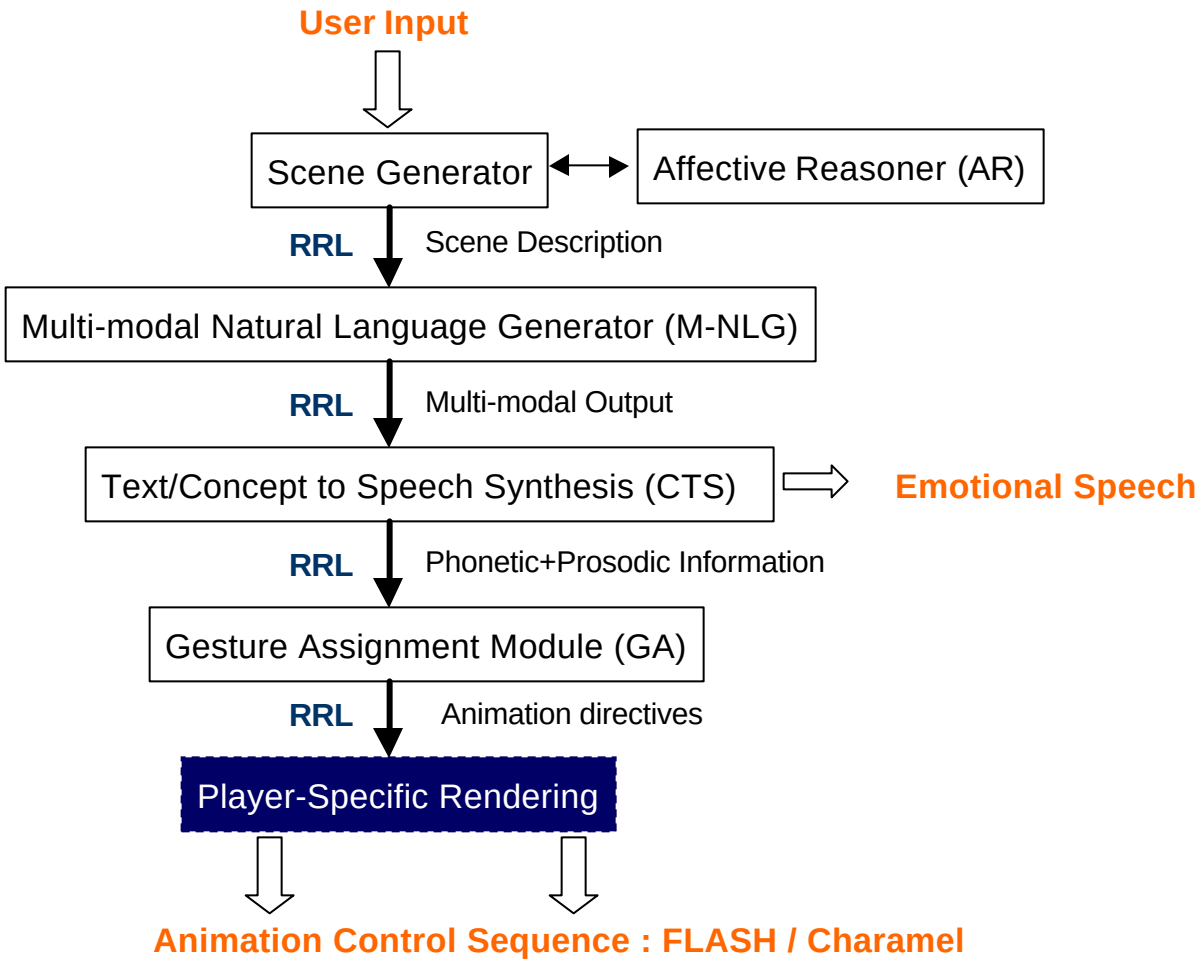
Player-Specific Rendering



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M-NLG: select content related gestures

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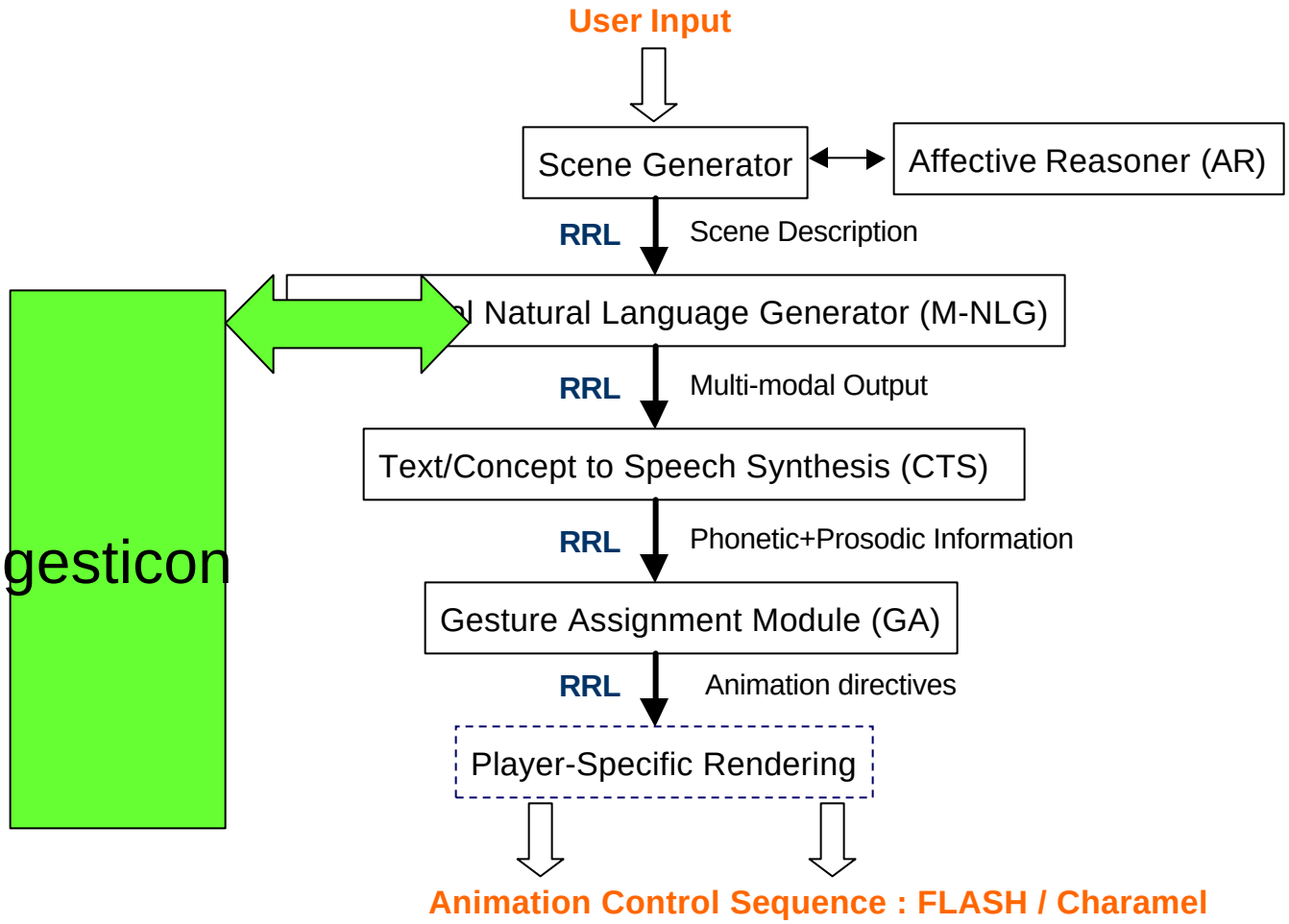

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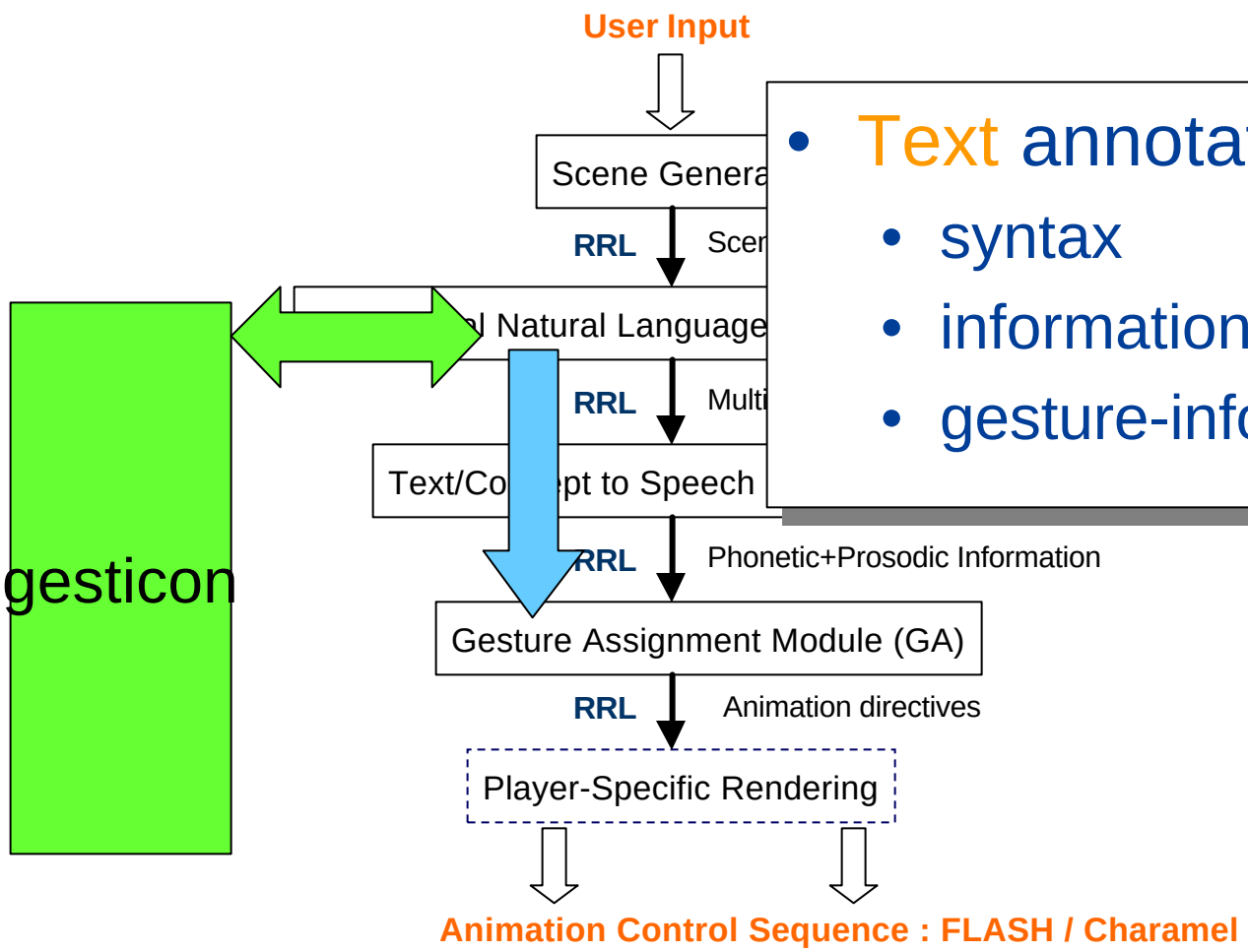
M-NLG output:



- Text annotated with:
  - syntax
  - information-structure
  - gesture-info

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M-NLG output

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User Input

gesticon

Tex

```
<sentence id="s1">
   <np id="np1">
        <word id="w1">…</word>
        <word id="w2">…</word>
        …
   </np>
   <vp id="vp1"> … </vp>
</sentence>
```

Animation Control Sequence : FLASH / Charamel

M-NLG output

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gesticon

Te

User Input

```
<sentence id="s1">
   <np id="np1">
        <word id="w1">…</word>
        <word id="w2">…</word>
        …
   </np>
   <vp id="vp1"> … </vp>
</sentence>
<gesture id="g1"
   identifier="greeting"
   alignto="w1"
   aligntype="seq-after"/>
```

M-NLG output

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gesticon

Te

User Input

```
<sentence id="s1">
   <np id="np1">
        <word id="w1">…</word>
        <word id="w2">…</word>
        …
   </np>
   <vp id="vp1"> … </vp>
</sentence>
<gesture id="g1"
   identifier="greeting"
    alignto="w1"
    aligntype="seq-after"/>
```

M-NLG output

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Te

User Input

```
<sentence id="s1">
   <np id="np1">
        <word id="w1">…</word>
        <word id="w2">…</word>
        …
   </np>
   <vp id="vp1"> … </vp>
</sentence>
<gesture id="g1"
   identifier="greeting"
    alignto="w1"
    aligntype="seq-after"/>
```

M-NLG output

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gestic

```
<sentence id="s1">
   <np id="np1">

   </n
   <vp
</ser

<gest
   alig
   alig
```

```
aligntype=

    ( seq-after |
      seq-before |
      par |
      par-end |
      par-adjust-to-fit )
```

Speech synthesis output: supplies timing info

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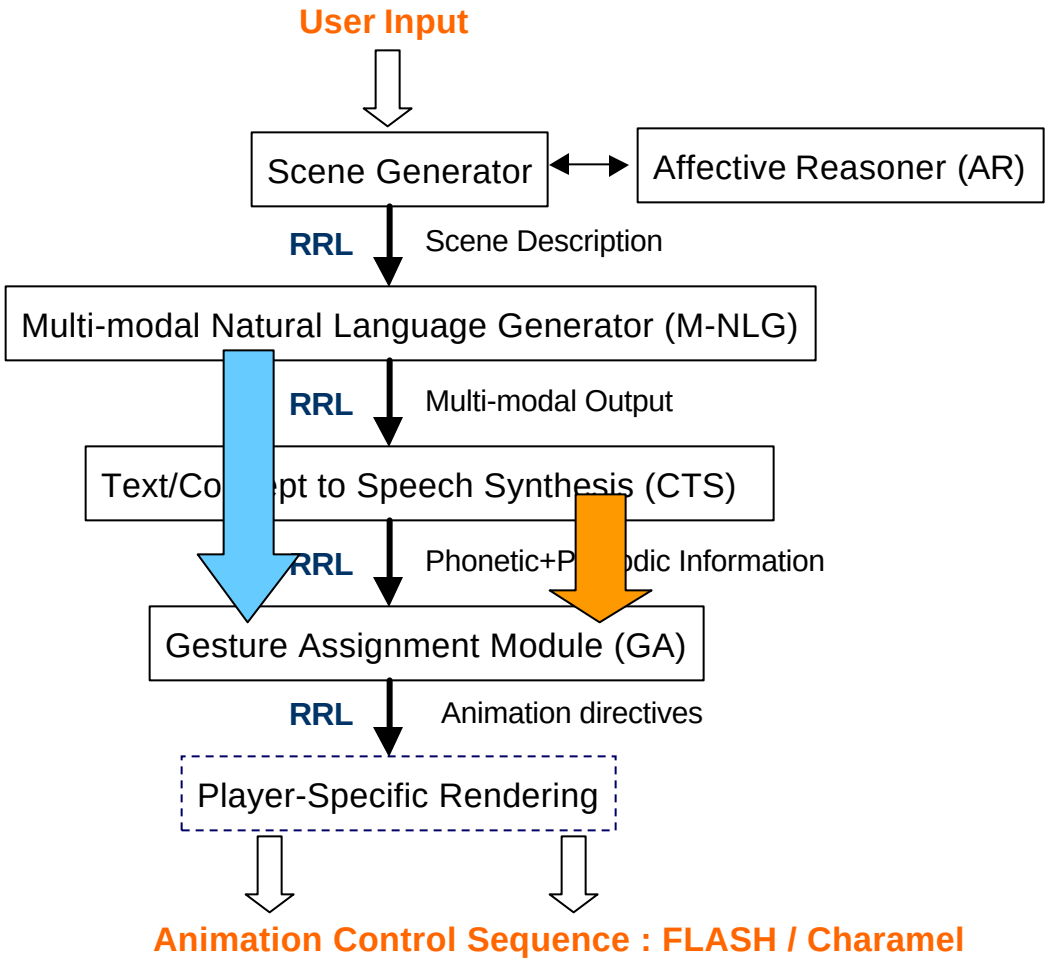

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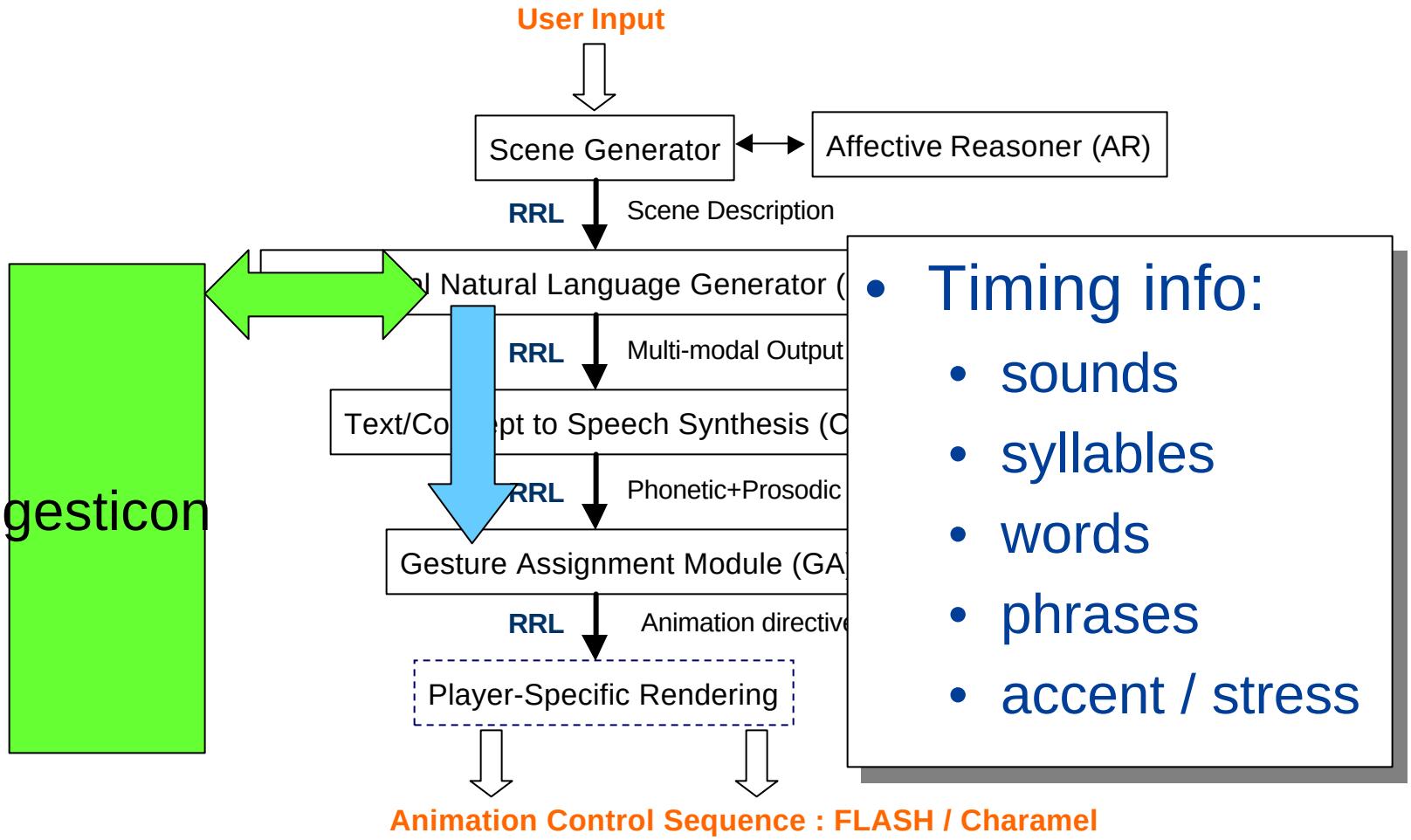
Speech synthesis output: supplies timing info



- Timing info:
  - sounds
  - syllables
  - words
  - phrases
  - accent / stress

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Speech synthesis output: supplies timing info

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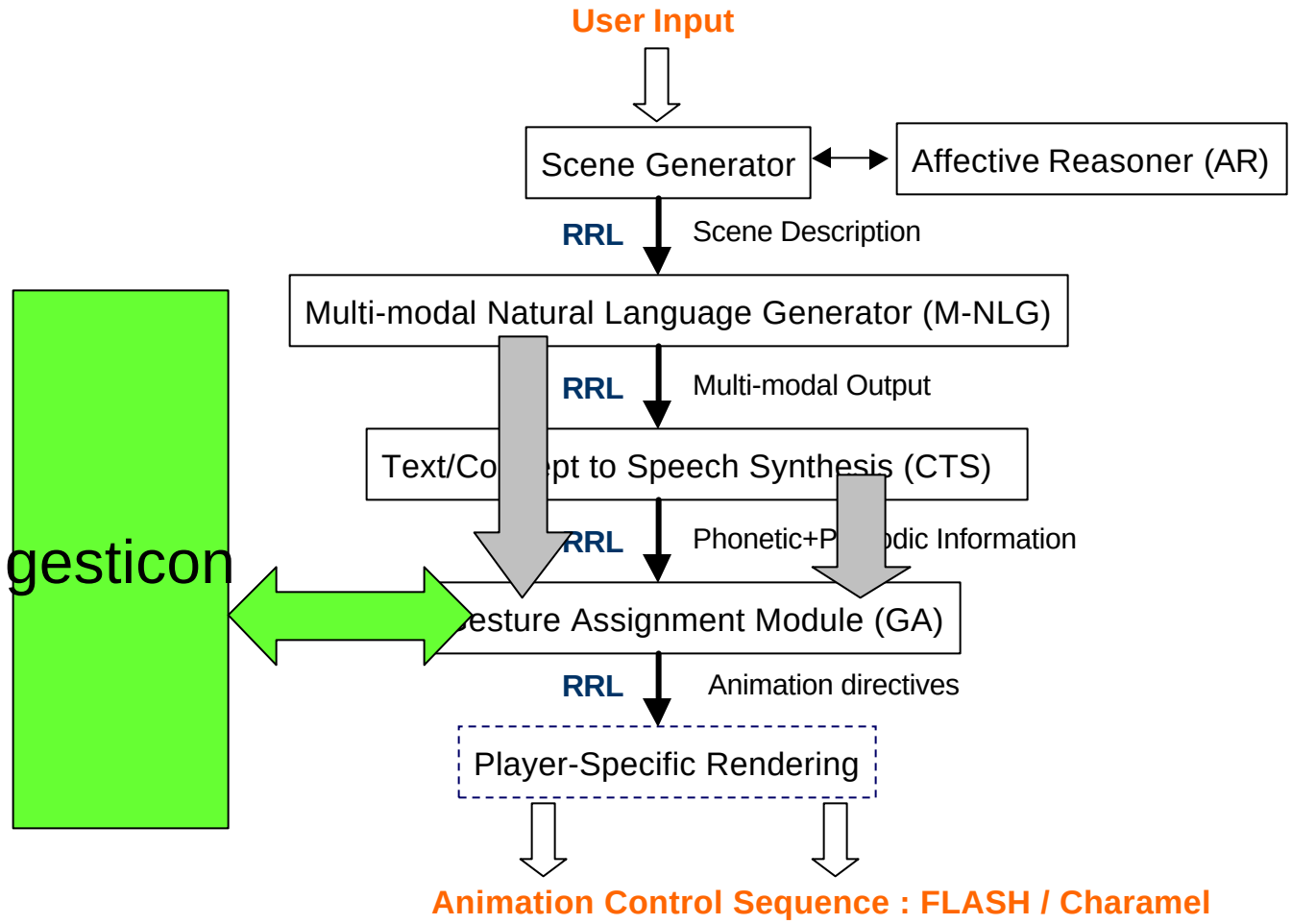
```
<sentence id="s1">
   <np id="np1">
        <word id="w1" sampa="hE.lO">
            <syll id="y1" accent="H*"
                  stress="3">
              <ph p="h" dur="72"/>
              <ph p="E" dur="86"/>
            </syll>
            ...
        </word>
        ...
</sentence>
```

GA:
add beats, idle, check constraints...



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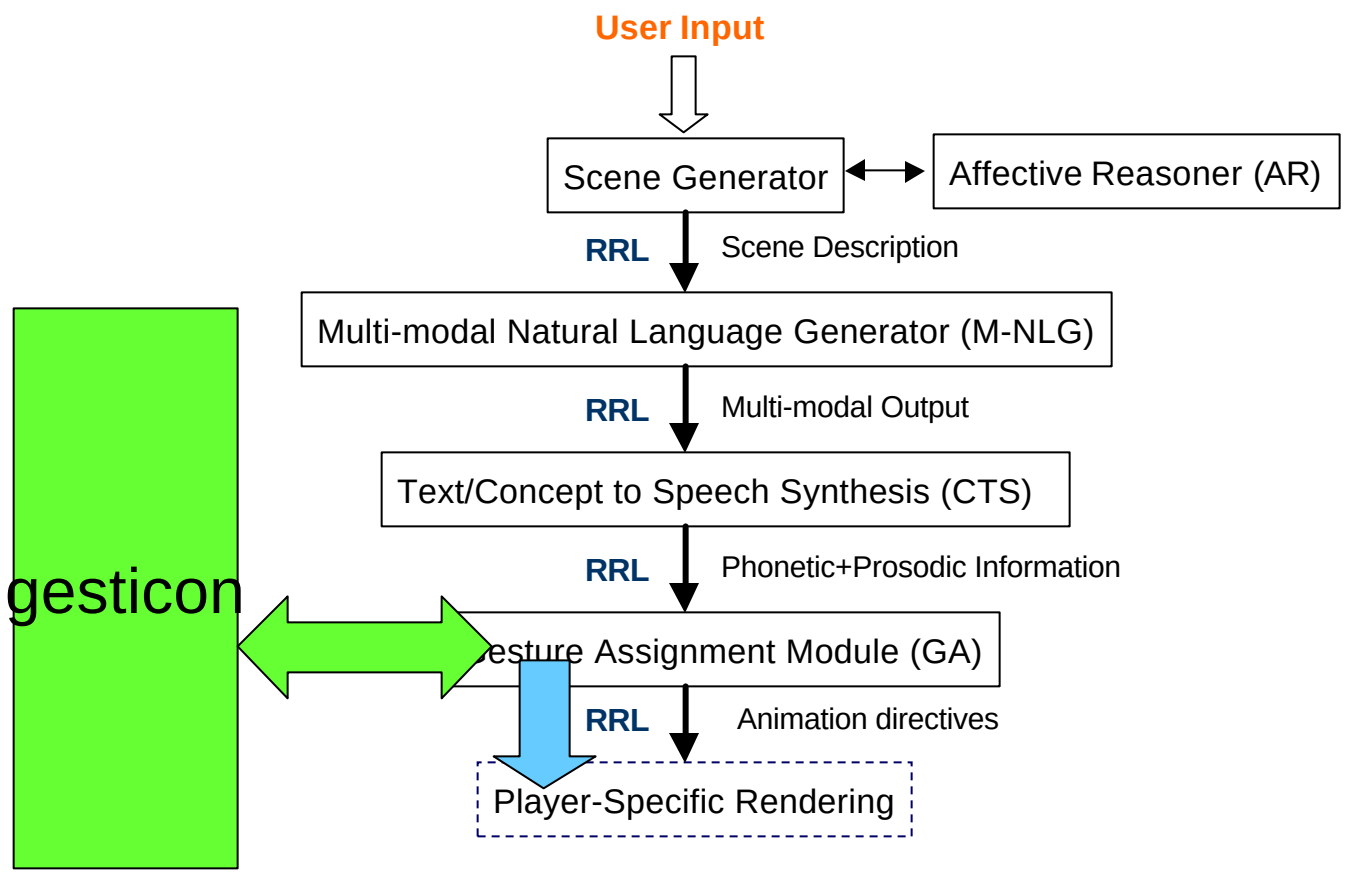
GA output: SMIL-structures



Animation Control Sequence : FLASH / Charamel

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GA output: SMIL-structures

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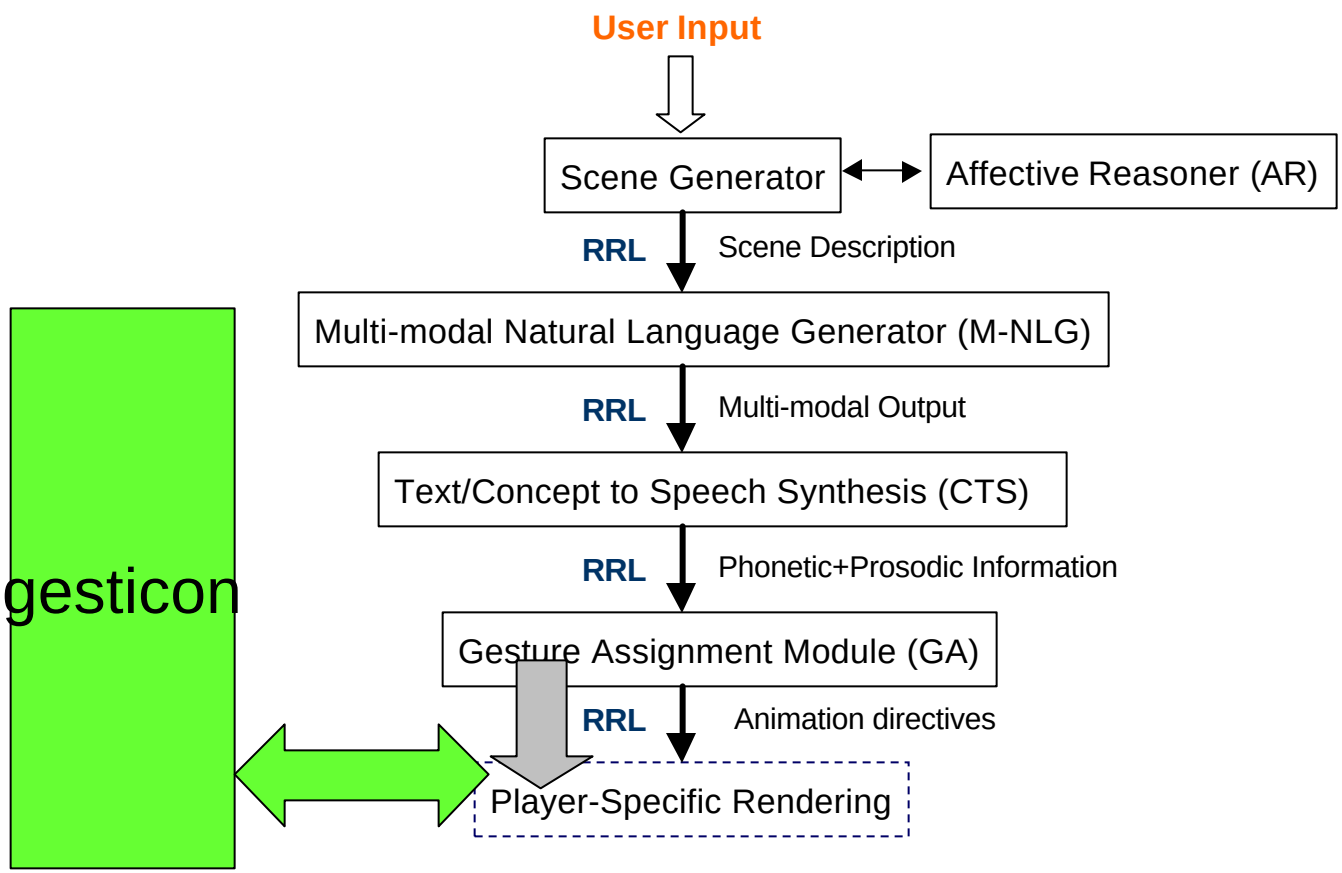
User Input

```
<animationSpec>
  <seq>
    <par>
      <audio src="s1.mp3"/>
      <gesture playkey="g124"
                begin="212ms"
                dur="420ms"/>
    </par>
    <gesture  playkey="g782"…/>
  </seq>
</animationSpec>
```

Player-specific rendering



Animation Control Sequence : FLASH / Charamel

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Player-specific rendering

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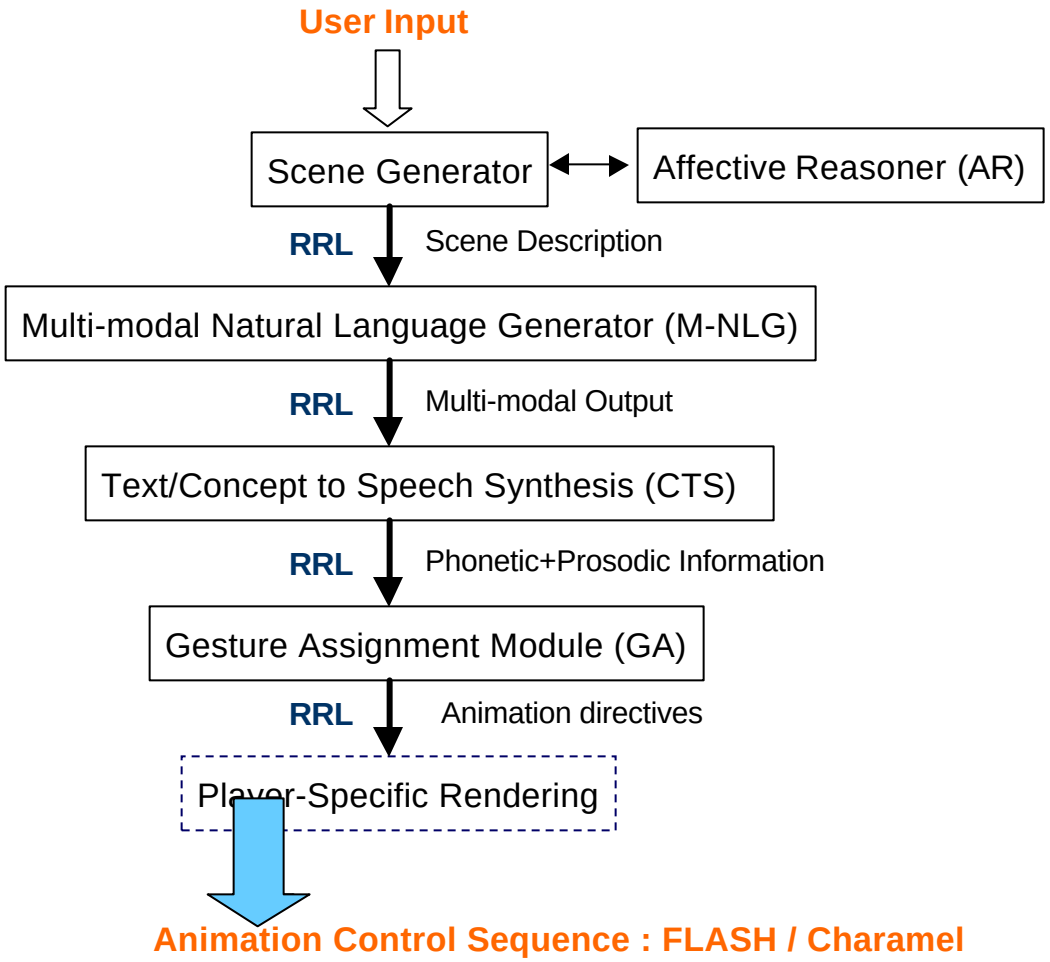

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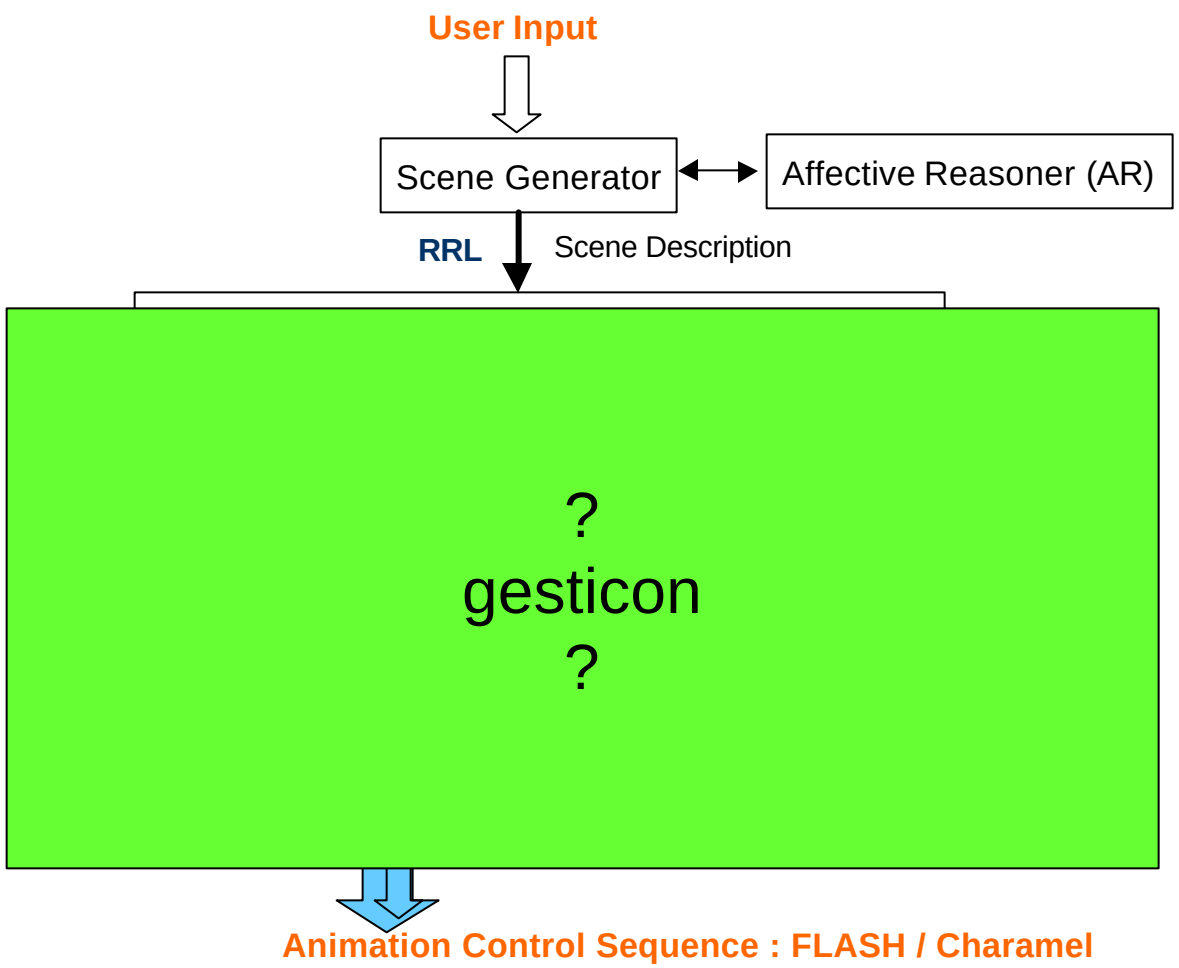
Player-specific rendering



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