Rover Executive for LITA

Vijay Baskaran, Nicola Muscettola
NASA Ames Research Center
Schematic of the Executive

IDEA Executive

IDEA Core  External Planner

Comm Relay

Navigator  Health Monitor

Go to waypoint  Done  Heartbeat  State information, Replan request

TEMPEST
The IDEA Core

Controlling System

Goal Register

Plan Service Layer

Plan Runner

Timing Service

Reactive Planner

Model Manager

MDB

MP

CORBA (transport layer)

Goal

Execution Feedback

Controlled System

Execution Feedback

Goal

Agent Relay

IPC (transport layer)

IpcQ (transport layer)

Model
# Timeline and token definition (an example)

<table>
<thead>
<tr>
<th>RoverState_SV</th>
<th>Camera_SV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stationary (Standby,..)</strong>&lt;br&gt;Duration : [1, infinity)</td>
<td><strong>Idle ()</strong>&lt;br&gt;Duration : [1, infinity)</td>
</tr>
<tr>
<td><strong>Moving (?status)</strong></td>
<td><strong>SnapShot(?status)</strong></td>
</tr>
<tr>
<td><strong>Stationary (Standby,..)</strong></td>
<td><strong>...</strong></td>
</tr>
</tbody>
</table>

- **RoverState_SV**
  - Stationary (Standby,..)
    - Duration : [1, infinity)
  - Moving (?status)
  - Stationary (Standby,..)

- **Camera_SV**
  - Idle ()
    - Duration : [1, infinity)
  - SnapShot(?status)

- **T i m e  l i n e  a n d t o k e n  d e f i n i t i o n**
  - RoverState_SV: 0, [t1,t2], [t3,t4],...
  - Camera_SV:...

- **Contained-by**

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Life in the Atacama
IDEA based Rover Executive (Nominal)

- **ExternalPlanner_SV**
  - {0}
  - Idle()
  - {t1}
  - Call_TEMPEST()
  - {t1.5}
  - {t4}
  - {t5<t6}
  - {t7<t8}
  - Idle()

- **Executive_SV**
  - {t1}
  - Standby()
  - {t2}
  - DriveAction()
  - DriveAction()
  - ChargeAction()
  - DriveAction()

- **RoverState_SV**
  - {t3,t4}
  - Stationary (Standby)
  - [t5,t6]
  - Moving()
  - [t7,t8]
  - Moving()
  - [t9,t10]
  - Stationary (Charge)

- **RoverState_SV**
  - [t3,t4]
  - Moving()
  - [t5,t6]
  - Moving()
  - [t7,t8]
  - Stationary (Charge)
  - [t9,t10]

- **RoverState_SV**
  - [t3,t4]
  - Moving()
  - [t5,t6]
  - Moving()
  - [t7,t8]
  - Stationary (Charge)
  - [t9,t10]

- **RoverState_SV**
  - [t3,t4]
  - Moving()
  - [t5,t6]
  - Moving()
  - [t7,t8]
  - Stationary (Charge)
  - [t9,t10]

- **RoverState_SV**
  - [t3,t4]
  - Moving()
  - [t5,t6]
  - Moving()
  - [t7,t8]
  - Stationary (Charge)
  - [t9,t10]

- **RoverState_SV**
  - [t3,t4]
  - Moving()
  - [t5,t6]
  - Moving()
  - [t7,t8]
  - Stationary (Charge)
  - [t9,t10]
IDEA based Rover Executive (Replan)

ExternalPlanner_SV
- Idle()
- Call_TEMPEST()
- Idle()
- Call_TEMPEST()

Executive_SV
- Standby()
- DriveAction()
- DriveAction(Standby)
- ChargeAction()
- DriveAction()

RoverState_SV
- Stationary (Standby)
- Moving()
- Stationary (Standby)

- [t3, t4]
- [t5, t6]
- [t7, t8]
- [t9, t10]

- (OK)
- [t3, t4]
- [t5, t6]
- [t7, t8]
Scenarios tested

• Used the test_tempest utility

• Generated 15 waypoints

• Cases tested so far
  • Nominal
  • Early return
  • No return (time out)
  • Failed status returned