

The image shows the cover of a spiral-bound notebook. The cover is a light beige or cream color with a fine, woven texture. A silver metal spiral binding is visible along the left edge. The text is centered on the cover in a bold, black, serif font.

Parameterized Action Representation

**Center for Human Modeling
and Simulation**

University of Pennsylvania

What do we want to represent?

- **Agents?**
 - **Emotions?**
 - **Personalities?**
 - **Culture?**
 - ...
- **Situations?**
- **Communication?**
- **Actions?**

Parameterized **Action** Representation

- **We also represent objects and agents.**
- **Based on research in NL and animation.**
- **Not created with conversational characters in mind.**
 - **Gestures and facial expressions are subtrees of the Actionary™**

At what level should we represent?

```
figure ["male_22.fig"] human {  
    support = "seated";  
    joint rthumb1->displacement = (-  
22.48deg);  
    joint rthumb2->displacement = (-  
9.69deg);  
    joint rpinfinger31->displacement =  
(11.83deg);  
    joint rpinfinger32->displacement =  
(5.00deg);  
    joint rringfinger22->displacement =  
(5.00deg);  
    joint rringfinger21->displacement =  
(15.84deg);  
    ...  
}
```

At what level should we represent?

“sit”

“sit on the chair”

“sit slowly”

“sit sadly”

“sit introvertedly”

“sit like Mike”

What level can we handle?

- **What level will we be able to handle soon?**
- **How much control do we want? How much are we willing to give up?**
- **Can we create a representation that allows both control and autonomy?**

PAR seems like the right level.

type parameterized action =

(name:	STRING;
participants:	agent-and-objects;
applicability conditions:	BOOLEAN-expression;
preparatory specification:	<i>sequence</i> conditions- and-actions;
termination conditions:	BOOLEAN-expression;
post assertion:	STATEMENT;
during conditions:	STATEMENT;
purpose:	purpose-specification;
subactions:	par-constraint-graph;
parent action:	parameterized action;
...	

previous action:

parameterized action;

concurrent action:

parameterized action;

next action:

parameterized action;

start:

time-specification;

duration:

time-specification;

priority:

INTEGER;

data:

ANY-TYPE;

kinematics:

kinematics-specification;

dynamics:

dynamics-specification;

manner:

manner-specification;

adverbs:

sequence adverb-
specification

failure:

failure-data).

Smart Motion Generators

- **Access to State of the World**
- **Access of State of the Agents**
- **Robust**
- **Parameterized (Controllable)**
- **Good transitions**
- **Good combinations**
- **Good failure recovery**

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