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Dance Movement Patterns Recognition (Part I)

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Acknowledgments

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  - Dennis Reidsma
  - Jordi Carrabina

- Thanks for the received aid of:
  - Herwin van Welbergen
  - Ronald Poppe

- Thanks to our family, friends, girlfriends (MLG) and partners.

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Presentation

- Joint project
- The Virtual Dancer
- Obtaining a greater interaction
- Recognizing dance movement patterns

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Goals

1. Starting up The Virtual Dancer application (computer vision part and artificial intelligent part)
2. Analyzing the application and developing improvements strategies
3. Recognition of simple dance movements
4. Recognition of dance movement patterns
5. Automatic generation of dance movement search patterns
6. Finding patterns without a reference

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Organization of the Exposition

- Virtual Dancer application
- The computer vision system “ParleVision”
- The work environment with the setup application and the used material
- The study carried out at the beginning of the project
- The implemented modifications in the computer vision system “ParleVision”
- Dance Movement Patterns Recognition (Part II)
  - HMM
  - Recognizing Simple/Complex Movements
  - Auto Generation of Complex Patterns Graphs
  - Test Bench
  - Conclusions

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The Virtual Dancer

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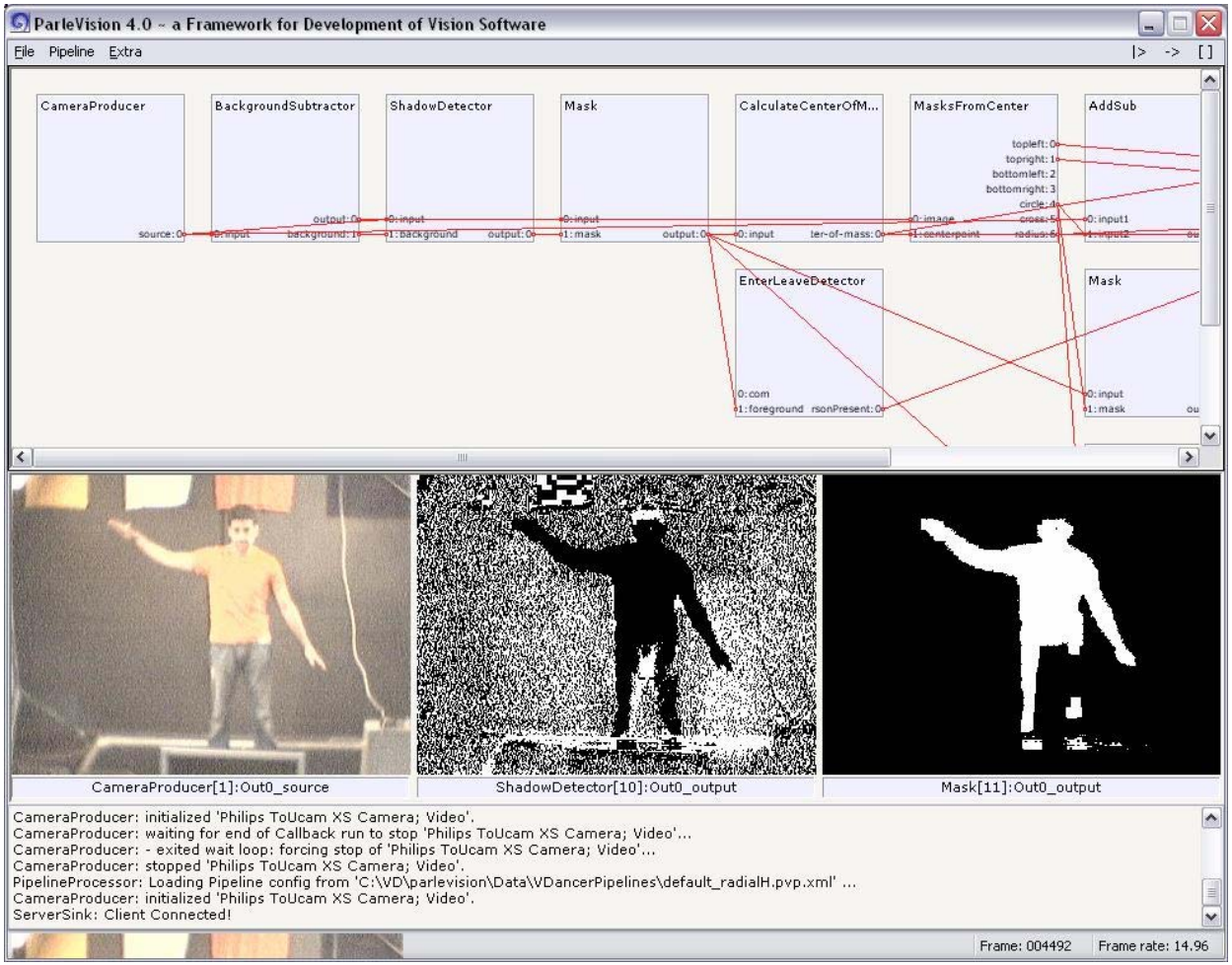
  - Variables, Animations & Transitions
  - Possible Improvements
- The Built System (CV)
  - New Added Features
  - New Created Pipelines
  - New Sent Variables

Parlevision



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Material

- Hardware
  - 2 computers with the following properties
    - Pentium 4 2.8GHz
    - 512 MB of RAM
    - Microsoft Windows XP with the SP 2
  - 1 camera
    - Philips ToUcam XS
- Software
  - ParleVision
  - Virtual Dancer
- Others
  - Human Dancer
  - A black background
  - t-shirts with different colors

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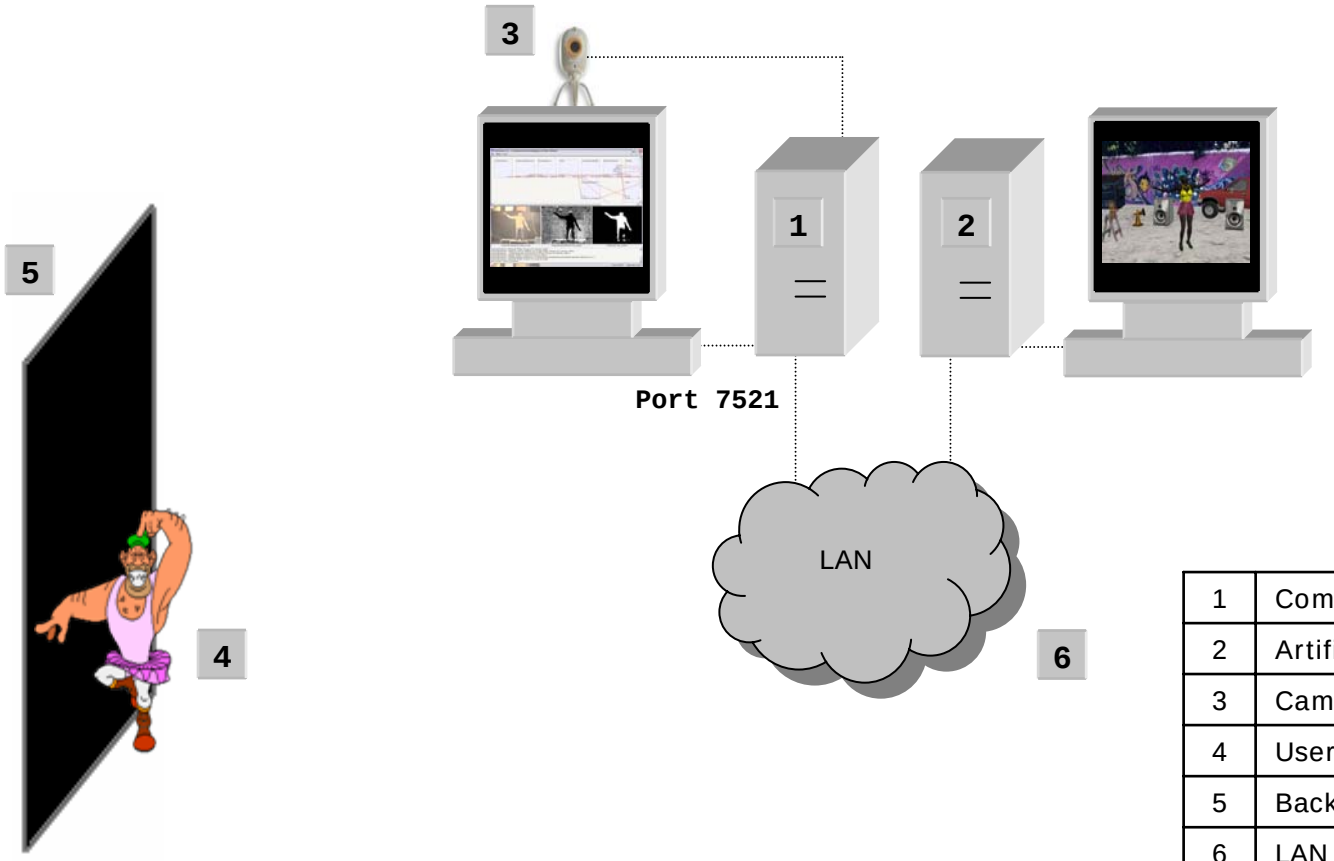
Setup



1	Computer Vision PC
2	Artificial Intelligent PC
3	Camera
4	User
5	Background
6	LAN

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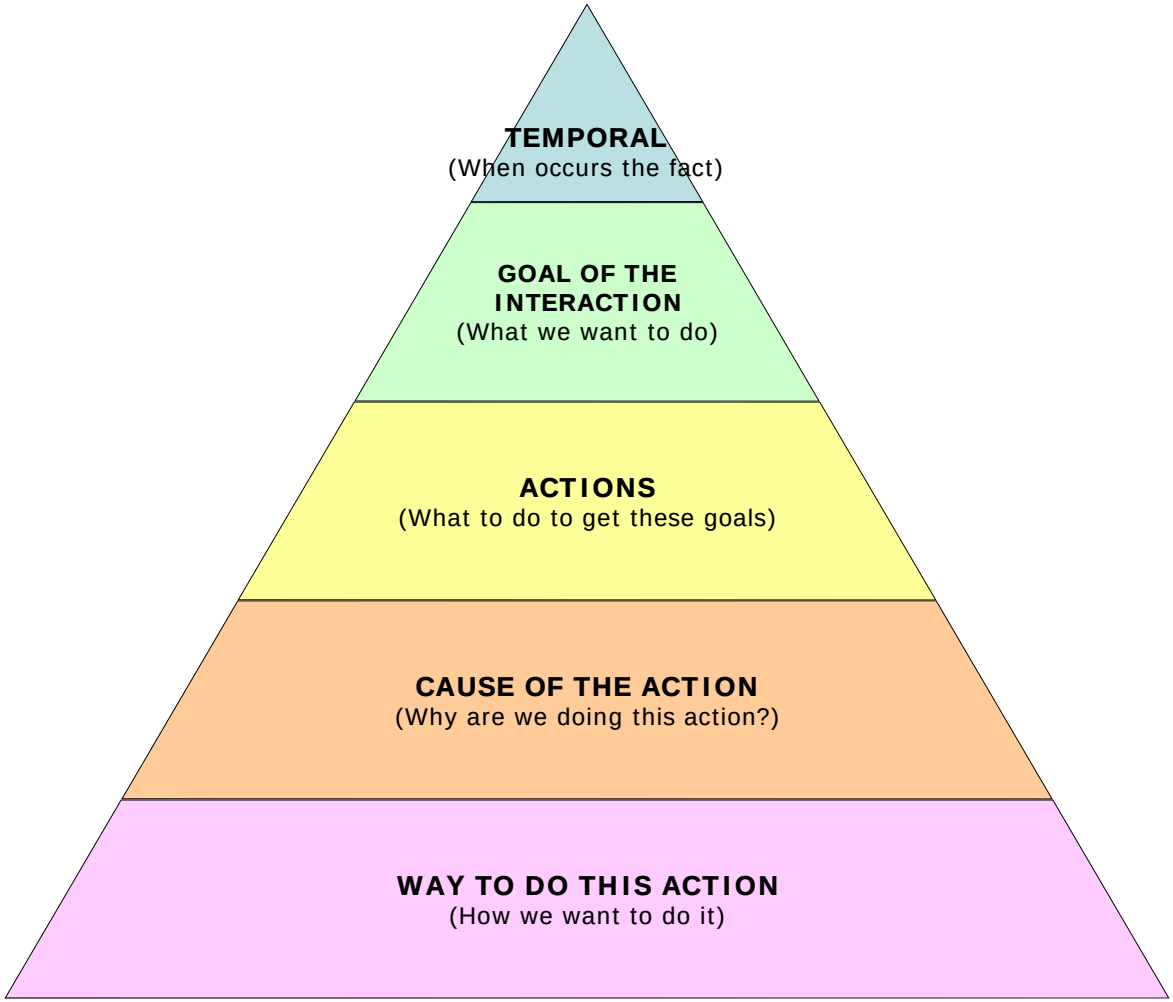
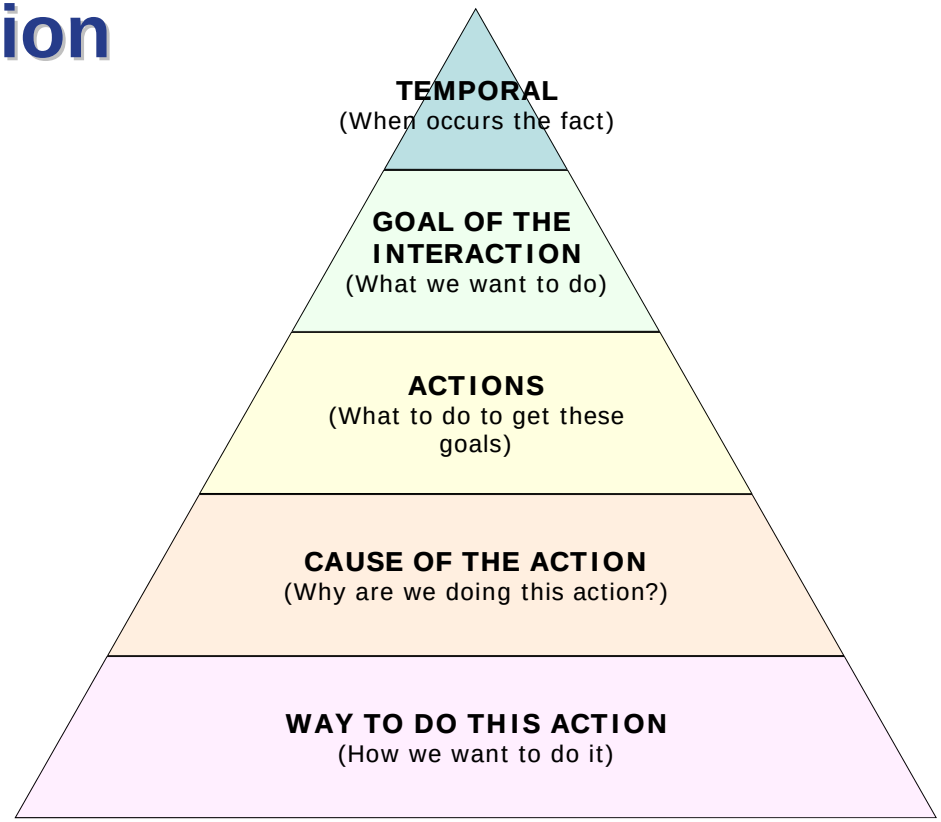
Interaction Dimensions



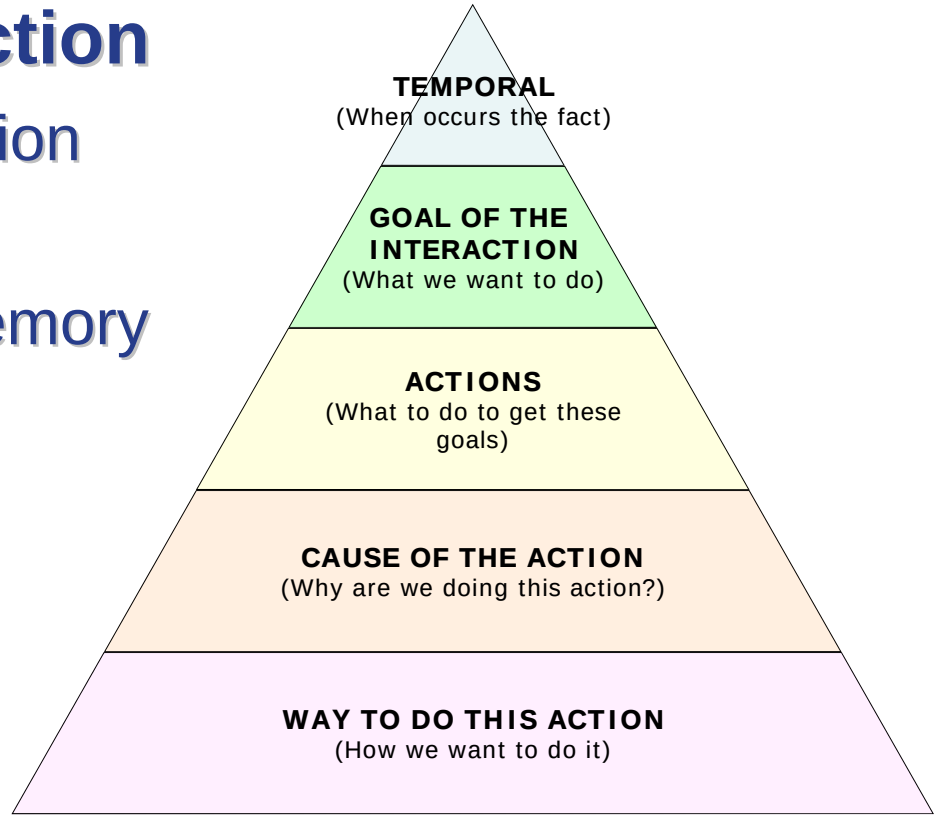
Interaction Dimensions

- **Temporal dimension**
  - Before the song
  - During the song
  - After the song
  - Between songs



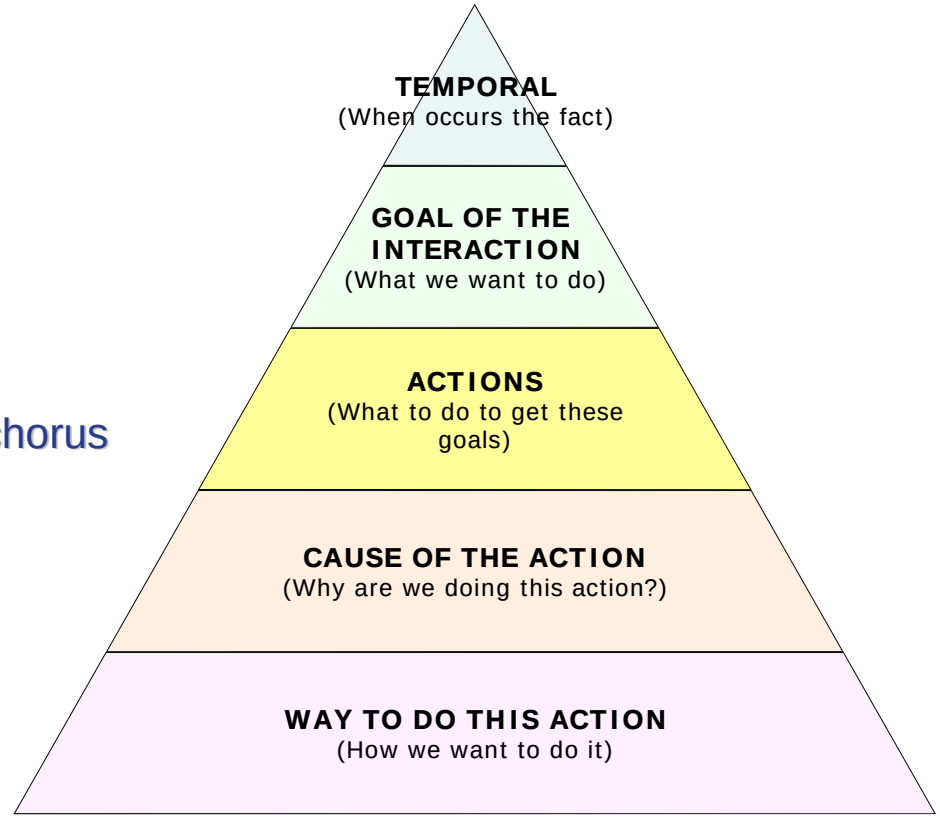
Interaction Dimensions

- **Goal of the interaction**
  - To attract the attention
  - To entertain
  - To leave a good memory



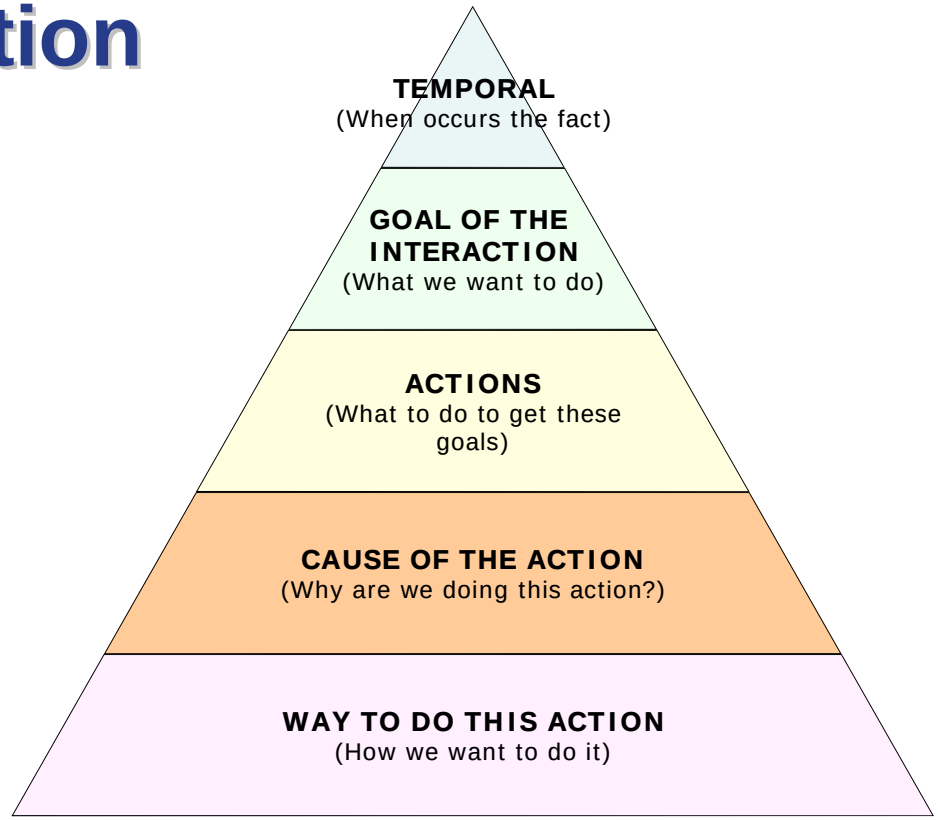
Interaction Dimensions

- **Actions**
  - To attract the attention
    - To say hello
    - To invite the user
    - To be seen
  - To entertain
    - To start the dance
    - To encourage the user
    - To do a choreography / chorus
    - To enrich the dance
    - To explain some step
  - To leave a good memory
    - To congratulate
    - To say goodbye



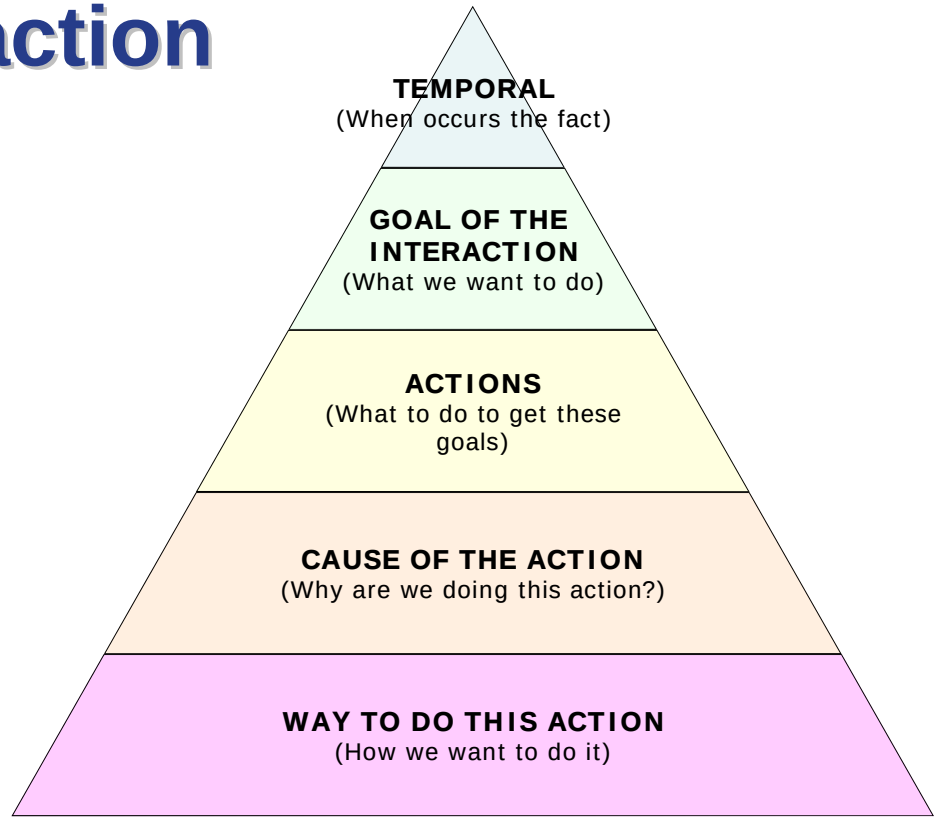
Interaction Dimensions

- **Cause of the action**
  - Reactive
  - Deliberative



Interaction Dimensions

- **Way to do this action**
  - Verbal
  - Non Verbal



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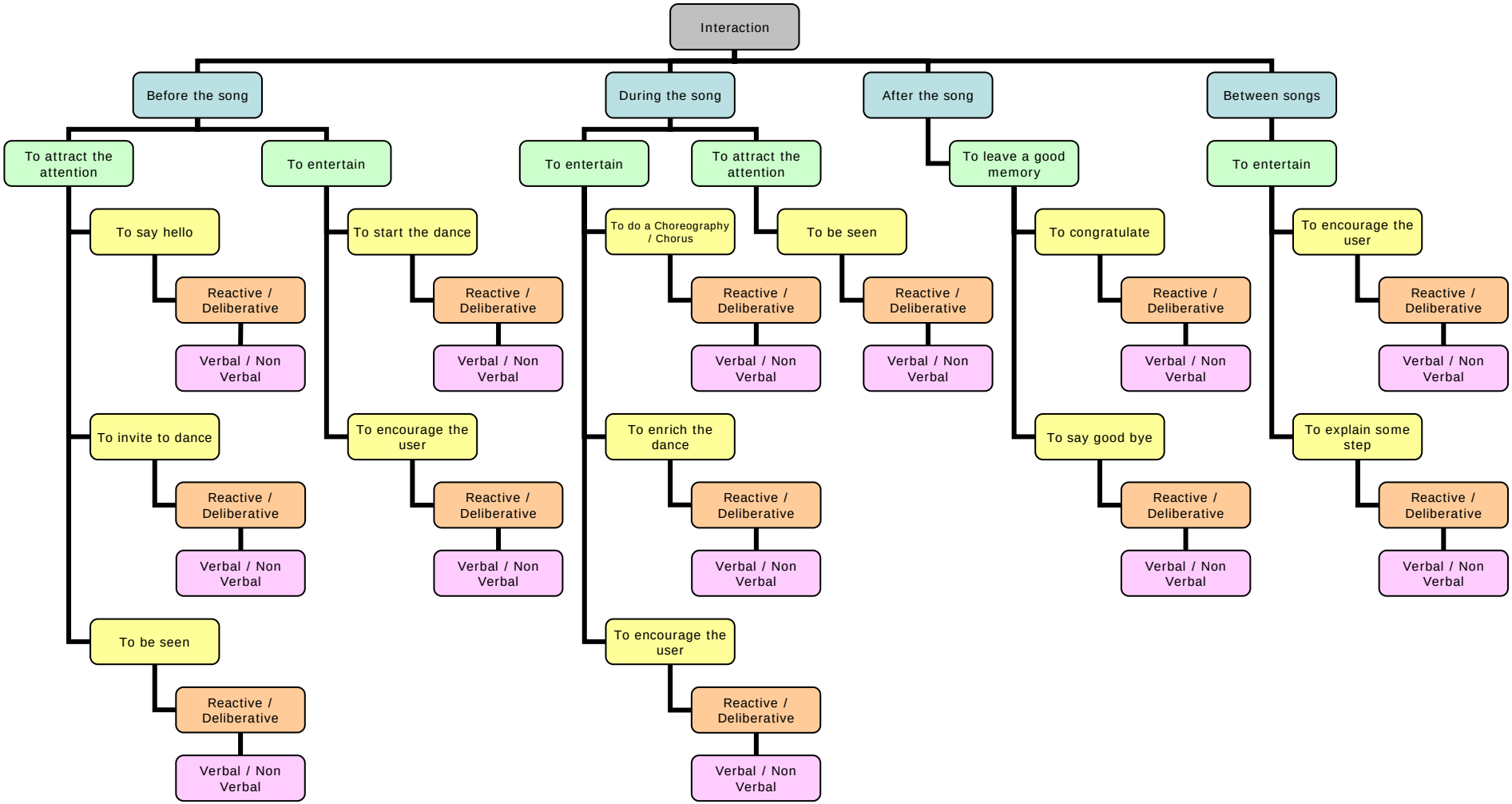
Interaction Tree



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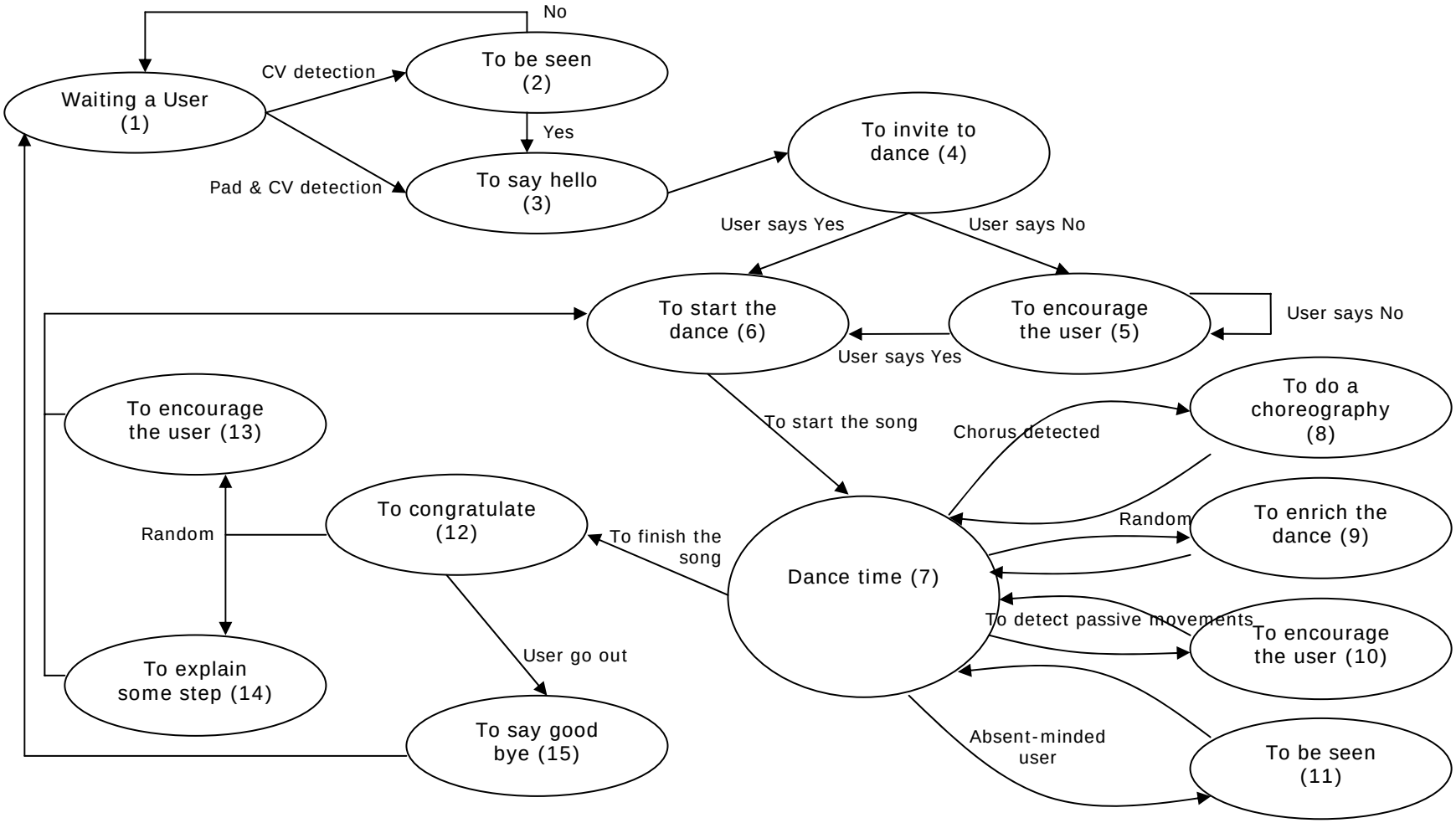
Interaction State Machine



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Variables, Animations & Transitions

- What animations we could use in each state
- New animations
- Conditions required for changing the state
- Available Variables
- New variables

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Possible Improvements

- **Animations**
  - To say hello moving the hand, looking at the screen center
  - To bow to the user
  - To clap to the user
  - To say hello putting the head up
- **Outputs**
  - That our dancer could speak
- **Inputs**
  - To recognize users' speech
  - To recognize head's movements
- **Pattern Recognition**
  - Simple movements' recognition
  - Patterns recognition
  - Creation of patterns automatically
  - Search of Patterns

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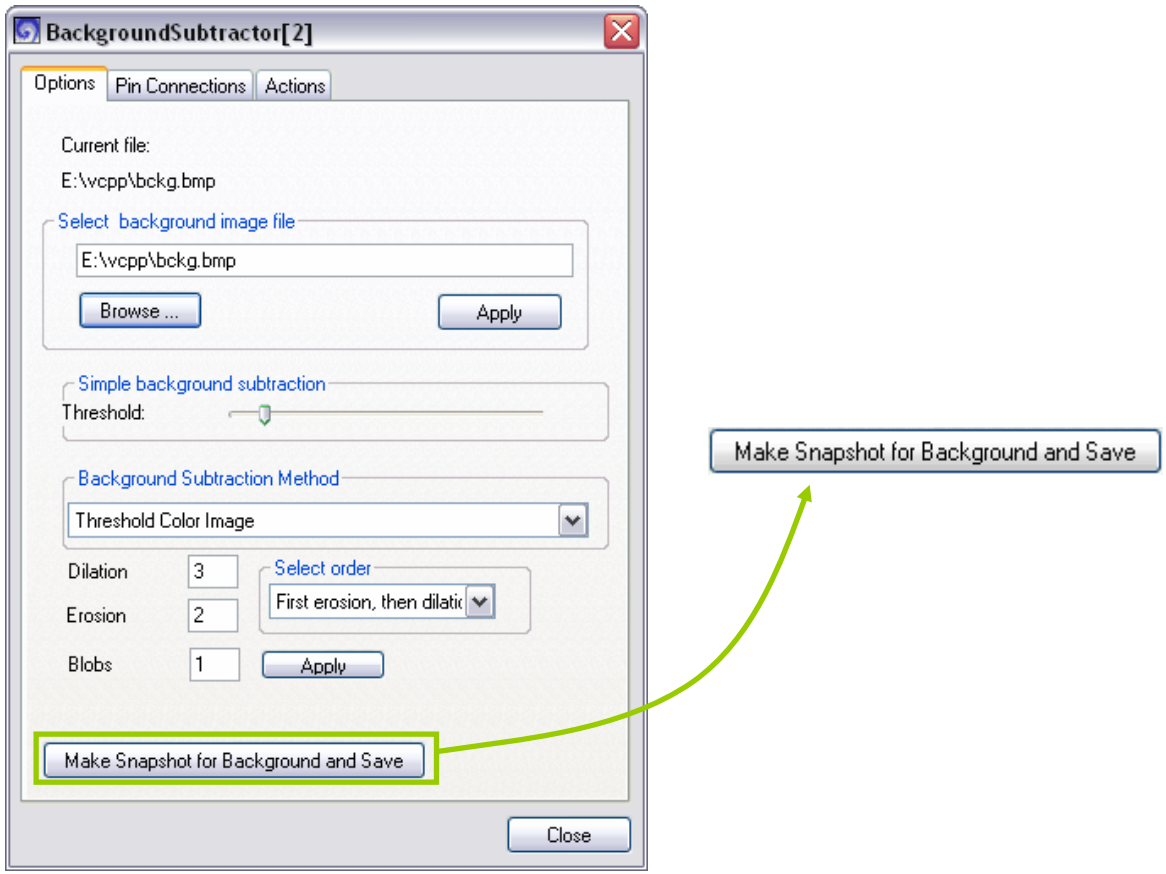
New Added Features



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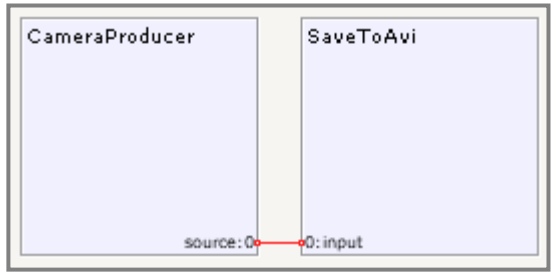
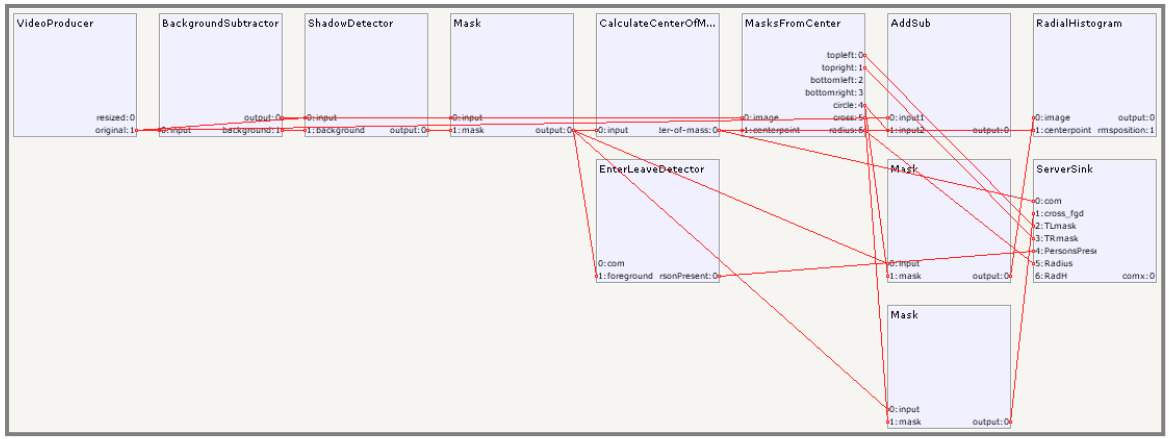
New Created Pipelines

- **Save Video Pipeline**

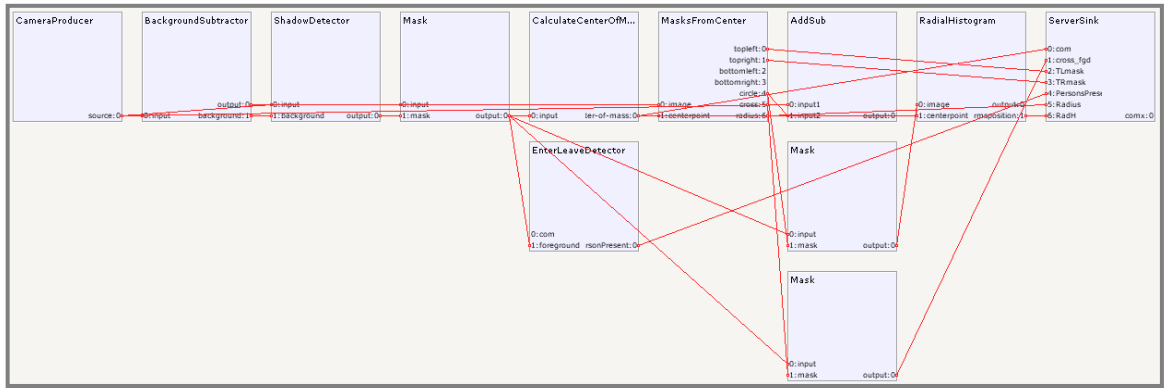


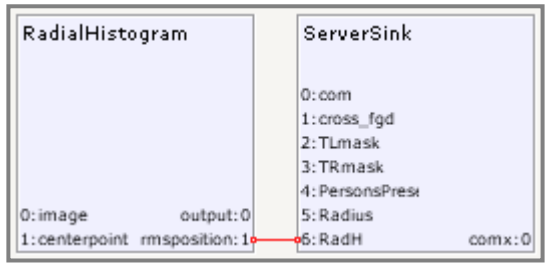
- **From Video Pipeline**



New Created Pipelines

- **Pipeline with Radial Histogram**





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New Sent Variables

- cumulativeHorActivityNormalized
- cumulativeVertActivityNormalized
- lHand
- rHand
- cumulativeRActivityNormalized
- r
- x
- y

Dance Movement Patterns Recognition (Part II) …

Bedankt voor uw aandacht !