



LabanEditor3: graphical Tool for Editing Dance Notation

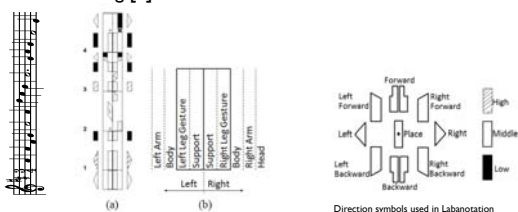
Worawat Choensawat

Outline

- ▶ Introduction
- ▶ Methodology
- ▶ Use of LabanEditor for Noh plays
- ▶ Conclusions & Future work

Introduction (Labanotation)

- ▶ Labanotation, the most common movement notation system, is widely accepted to record human movements for choreography and dance training [1].

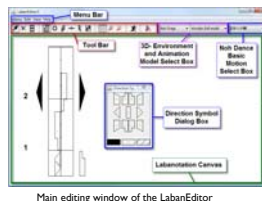


(a) Example of Labanotation score.
(b) Columns of Labanotation representing body parts.

[1] A. Hutchinson: Labanotation, Theatre Arts Books (1977)

Introduction (LabanEditor)

- ▶ LabanEditor[2] as an interactive graphical editor for writing and editing Labanotation scores.
- ▶ Display the CG animation of human body motion corresponding to the Labanotation score



Main editing window of the LabanEditor



CG animation display window (MotionViewer)

[2] K. Kojima, K. Hachimura, M. Nakamura: LabanEditor: Graphical Editor for Dance Notation; Processing of IEEE 2002 Int. Workshop on Robot and Human Interactive Communication, pp. 59-64 (2002)

LabanEditor3

- ▶ LabanEditor3 is LabanEditor version 3
 - ▶ Virtual environment module allows users to select the 3D virtual environments such as stages and animation character models.
 - ▶ Dynamic Template Technique
 - ▶ Motion expression for expression more natural movement.

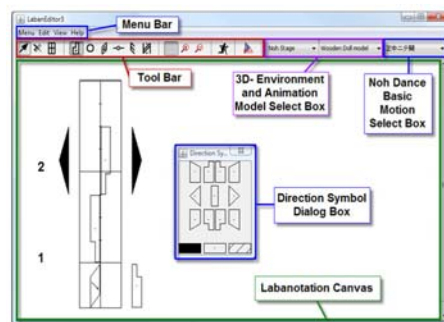


Previous Version



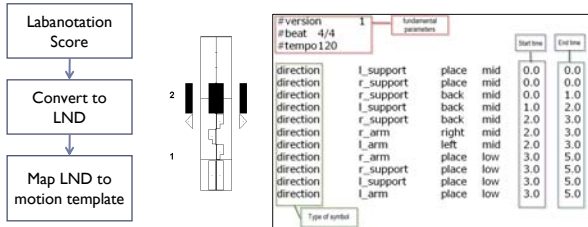
LabanEditor3

LabanEditor3 (Demo)



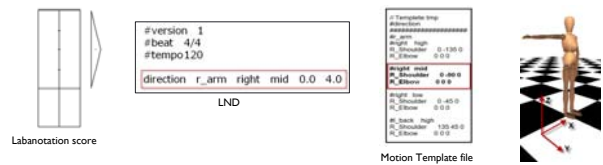
Conversion from Labanotation Scores to CG Animation

- In our LabanEditor system, Labanotation scores can be represented as a simple text format called LND.



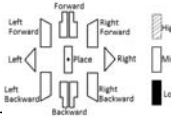
Mapping LND to Motion Template

- The template file consists of the relationship between a direction symbol at the particular joint and the rotation and the translation of that joint



Dynamic Template Technique

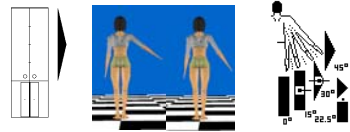
- Labanotation can describe any human body movement including even the finger motion.
- But the resulting score becomes extremely complicated and in that detail level is rarely used.
- Therefore, the fundamental description based on 9 directions in a horizontal plane and 3 directions in a vertical plane has been usually used.



- How to describe and represent traditional dance body motion by using fundamental description of Labanotation.

Dynamic template technique

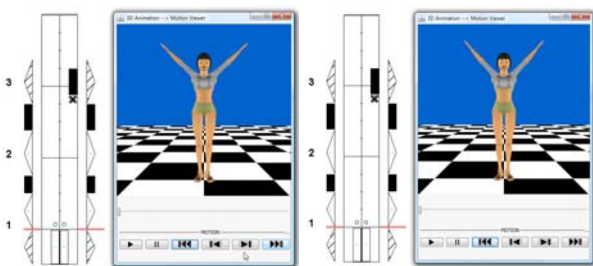
- In the fundamental description, similar but distinct poses are sometimes defined by the same symbol.



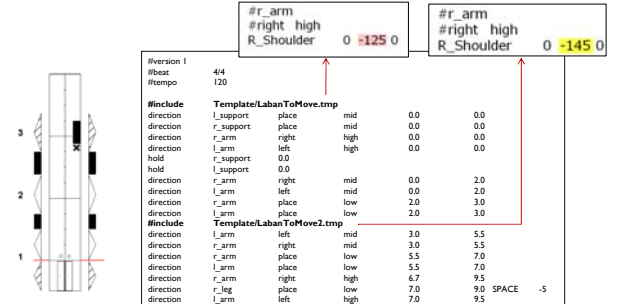
- The idea of the dynamic template technique is to use multiple templates for describing a Labanotation score.

Dynamic template technique

- In the fundamental description, similar but distinct poses are sometimes defined by the same symbol.



Dynamic template technique



Dynamic template technique Demo

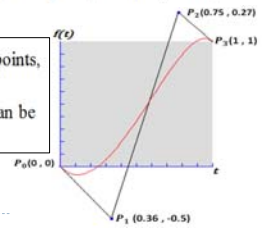


Motion Expression Control

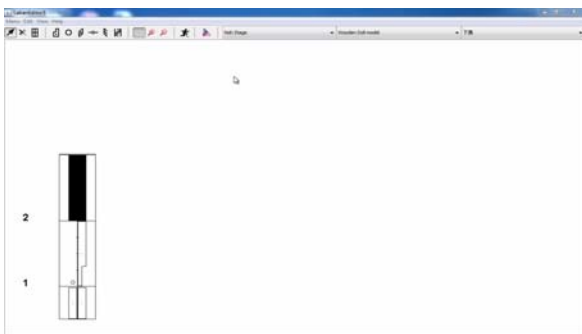
- ▶ The motion expression control module controls the animation of character model from one key frame to the next key frame.
- ▶ We implemented a module for controlling the motion by applying a non-linear interpolation, cubic Bezier curve, in order to create natural movement.

$$f(t) = (1-t)^3P_0 + 3(1-t)^2t \times P_1 + 3(1-t)t^2P_2 + t^3P_3$$

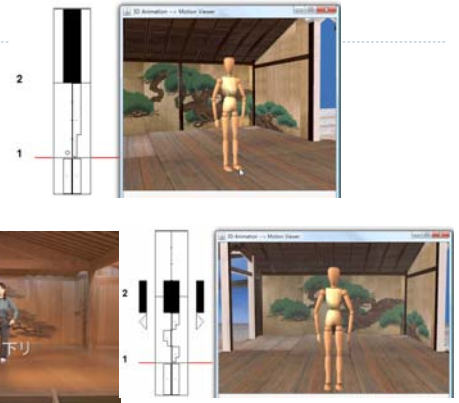
- $P_0(0,0)$ and $P_3(1,1)$ is the start and end points, respectively.
- P_1 and P_2 are the control points which can be moved freely



Motion Expression control (Demo)



Results



Results



Results



Conclusions

- ▶ In this research, we presented the implementation of LabanEditor3 and how to produce the 3D animation of human model corresponding to the Labanotation score in a virtual environment
 - ▶ LabanEditor3 successfully describes and reproduces Noh Kata, one of stylized traditional dance body motion, by using the dynamic template files.
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Future Work

- ▶ Our next step involves the Labanotation functionality and the character animation as follows:
 - ▶ Extensions for handling many extensive symbols of Labanotation must be required.
 - ▶ The number of Noh Kata which can be handled in LabanEditor must be increased.
 - ▶ Other stylized traditional dance must be described and reproduced.
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Publication

- ▶ Worawat Choensawat, Sachie Takahashi, Minako Nakamura, Woong Choi, and Kozaburo Hachimura: "Description and Reproduction of Stylized Traditional Dance Body Motion by Using Labanotation", Transactions of the Virtual Reality Society of Japan, Vol.15, No.3, pp.379-388, 2010
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