# MULTI CHARACTER ANIMATION SYSTEM FOR KIDS BASED ON PATH FOLLOWING

**Alaa ALHERZ[1], Naoya TSURUTA[1], Koji MIKAMI[1] and Kunio KONDO[1]**
[1]Tokyo University of Technology, Japan

We present an interactive system, which allow the user (kids) to move hand drawing and/or pictures without drawing a large amount of pictures. A traditional cartoon animation requires drawing each animation frame by hand. Computer-based animation system can generate interpolated frames, however, the user has to set start and end poses on the key-frames. Both ways take time and effort, and not suitable for the kids. Instead of these approaches, there are several animation systems designed for kids, which simply move and rotate a 2D image. Although an animation with a single character can be created easily, the user still has to set a key-frame for each character when moving multiple characters, and if not the characters will have the same movements.

Our goal is to design an animation system, which solves these problems; the user can control multiple characters by simple user operations. Each character should have a different movement without individually operating ones. This is very important to allow the kids to enjoy making and watching their animations.

In this paper, we introduce a system for kids to help them make an animation based on path following technique (Figure 1). Path following is one of crowd simulation for controlling multiple characters [1]. The user can input multiple characters and control them with a single path. The crowd simulation technique allows each character to have different motion. Characters have the ability to maintain distance from others.

We also use line of action technique [2] to deform a character and give it realistic motion while following the path, so the kids will enjoy making animation have nearest concepts to the traditional hand-drawn ones. A line of action is an imaginary curved line used by cartoonists in the early stages of character design, to specify character global shape. The mathematical (geometric) definition of this line, allow us to automatically compute the character deformation. We show that our system creates multi character animation with smaller numbers of user operations than existing computer animation programs. Our prototype system tested as well by making kids who used several animation making applications, and we obtained positive feedbacks.

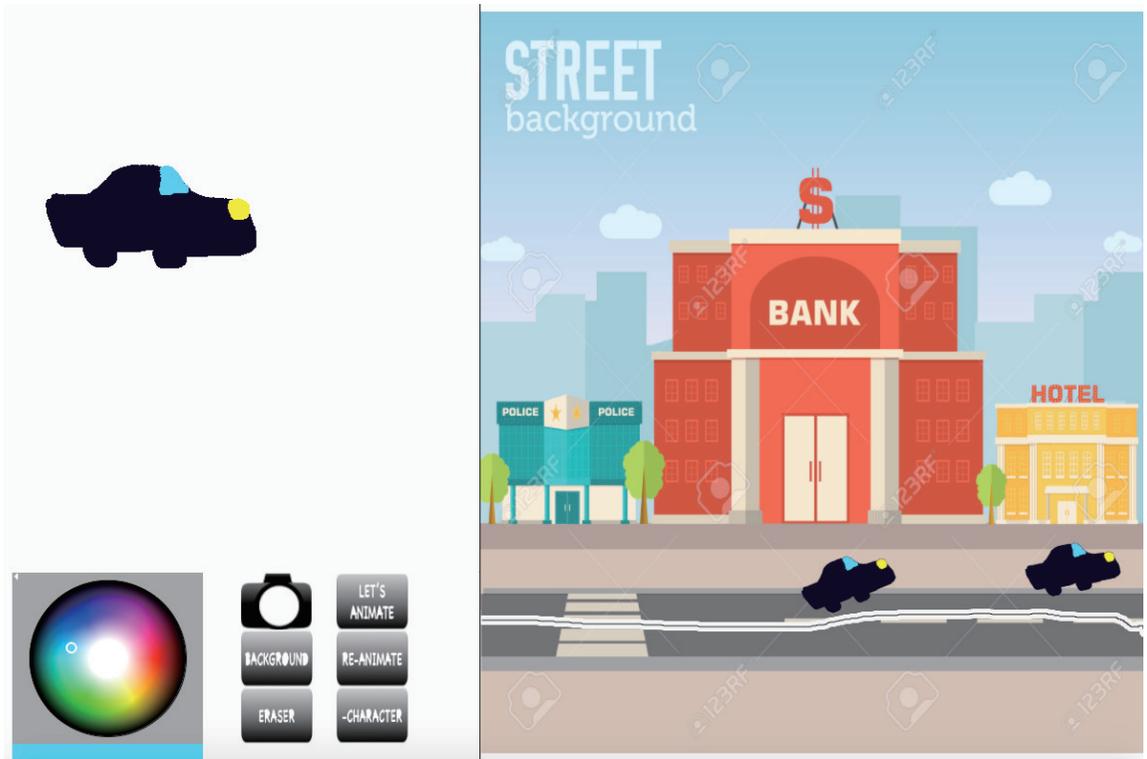Keywords: Interactive animation system, Multi character, Path following

Figure 1: system interface

**Reference**

1. Daniel Shiffmen ”**The Nature Code: Simulating Natural Systems with Processing**”, The Nature of Code, 2012.
2. Martin Guay, Marie-Paule Cani and Remi Ronfard”**The Line of Action: an Intuitive Interface for Expressive Character Posing”** SIGGRAPPH Asia 2013, Vol. 32, No.205, 2013.