

# The instructional support tool for the drawing learning support system for novice learners

Takashi Nagai<sup>1</sup>, Mizue Kayama<sup>2</sup>

1 Interdisciplinary Graduate School of Science and Technology, Shinshu University, Nagano, Japan, 11st253j@shinshu-u.ac.jp

2 Shinshu University, Nagano, Japan, kayama@cs.shinshu-u.ac.jp

The purpose of this study is to explore a support system for beginners in drawing in a networked environment. Learners can receive advice and assessments from art experts without time and/or place constraints by using the proposed system. In this paper, we describe the drawing process model(DPM) and the instructional support tool using this is proposed.

The major difference between an offline drawing class and an online drawing class is the availability of instruction during learners' drawing. The instruction for the learners' drawing process is more important than instructional comments for his/her work. Therefore, quick and personalized feedback from a tutor is an indispensable function for a networked learning environment. In this study, the learner's drawing process that is recorded by a digital pen is reused to replay and refer his/her drawing process. To generate an evaluation for the drawing process automatically, these data are also reused in the system the authors propose.

The DPM consists of three types of parameters. They are the drawing step, the drawing phase and the features of the drawing strokes. The drawing step is how to draw drawing heard from tutors. The drawing phase consisted of three phases and discovered the phase from expert's drawing process. The features of the drawing strokes are six parameters based on the geometric characteristics on strokes.

Our system is working from 2013 in the art school. The instructor can instruct all the learners' drawing by using our system. However, the instruction of a learner's drawing needs time because a learner's drawing process is played back repeatedly using a drawing process viewer. By analyzing a learner's drawing process using this DPM, and showing results aims at easing instructor's instruction burden.

Keywords:

Art education, Drawing, Digital pen, Drawing process model, Drawing strokes, Drawing phases