This paper shows how a software toolkit can allow graphic designers to make camera-based interactive environments in a short period of time without experience in user interface design or machine vision. The Attention Meter, a vision-based input toolkit, gives users an analysis of faces found in a given image stream, including facial expression, body motion, and attentive activities. A four day workshop demonstrated that some Flash-savvy architecture students could construct interactive spaces (e.g. TaiKer-KTV and ScreamMarket) based on body and head motions.

**TaiKer-KTV**
TaiKer-KTV enhances the interactivity of the performer and the environment for a more responsive and intimate karaoke space. TaiKer-KTV demonstrates how karaoke spaces engaged with the song can interact with the whole physical space based on the performers' physical reaction and body movement.

In the implementation, an interactive music video was created in Adobe Flash and was projected on a wall. The lyrics go with a nodding head indicator to lead singing and dancing. The video is best still and dull if it doesn't get enough attention, getting more animated only when people dance like Tai-Kais. Furthermore, the more people are engaged, the more special visual effects are applied. Some general rules have been defined for the techniques of the music video:

- If one shakes his head, the environmental light flashes more dramatically.
- If one nods his/her head, the image switches faster.
- If one moves his/her body, the image gets clearer.

TaiKer-KTV has been implemented in Flash with Attention Meter. By using a microphone, people can yell to respond to the stage and get visual feedback. Some general rules have been defined for the techniques of the music video:

- If more people are gathering in front of the stage, the dancers will show up.
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- If there are multiple people participating, the media elements (i.e., symbols, visual effects, texts and recorded screaming voices) have an additive effect, creating a vivid mix of sound and imagery.

ScreamMarket is implemented in Flash with Attention Meter. By using a microphone, the atmosphere of the interaction creates a realistic simulation of the night market.

The process of interaction is similar to the behavior that we watch the interactive show or bargain with the hawker in the night market. According to the method of interaction, the users are not simply viewers, but also performers in their own right. 30 people took turns in an exhibition interacting with the ScreamMarket. People were able to figure out and use it within a minute. It combines output based on the regular environment noise, so that people may need to scream very loudly to interact with the Flash movie. The atmosphere of the interaction creates a realistic simulation of the night market.

The attention and feedbacks. This system demonstrated how audience engaged with the performance by monitoring their visual attention and audio feedbacks. The interactive show is implemented in Adobe Flash with Attention Meter as an attention-based triggering mechanism.

**Attention Meter**
A Vision-based Input Toolkit for Interaction Designers

**TaiKer KTV**
Interactive Karaoke environment

**ScreamMarket**
Reactive performance

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