## Traffic and other works,

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Leveraging on several years of research and development in facial recognition, emotion detection, sensor and vision systems, the exhibition brings together in a series interactive installations and artworks. The exhibition includes two or three medium-to-large scale artworks and a series of smaller wall and pedestal-based pieces.

The two main pieces proposed can be complemented with other smaller reactive touch sensitive light based objects using LED and capacitive sensing.


Videos of the installation can be seen at：
https：／／pensyl．com／p51Traffic．html

## Red－Green－Wait（红绿灯）

$9^{\prime}$ tall $\times 12^{\prime} \times 3^{\prime}$ deep
A responsive installation using 24 actual traffic signals， with software that detects emotion states of viewers within the space．The individual lights display a series of patterns that range from all red，to all yellow to all green，with varying in－between states．The patterns will also display intermediate behaviors with randomized， patterns，and even one iteration of Conroy＇s Game of life．

Emotion recognition software developed for this work transmits to a cloud－based detection emotion API where captured images are analyzed for a weighted response of the seven basic emotion states．Cameras strategically situated in a gallery and public space detect faces in the field．Emotion states are averaged over a short time interval to create a composite of the emotions detected． The pattern states of lights are modified based on this composite emotion states over time．


## 8' wide, $7.6^{\prime}$ tall, 3 ' deep

The installation uses 25 actual traffic lights controlled with a Rapsbery Pi3 microcontroller, a vision system,five 16 -channel relay banks, controlled by 5 MCP23017 GPIO extender ICs. The lights patterns states are modified based on emotions detected in public space.

The light patterns are varied based on a range of detected emotional expressions, where positive emotions evoke color ranges in green, neutral in red and negative emotion evoke red.

Traffic


In public spaces, low cost web cams are located in several areas. Images captured over periodic intervals.

Faces identified and classified for emotions expressed
Emotional state of the building is assessed
Installation light behavior reacts to emotion states



## MoodModArt

$90^{\prime \prime}$ wide, $28.5^{\prime \prime}$ tall
A reactive artwork that detects facial cues from participants moods in remote sources via mobile app

On the left is four oil painting still life panels. On the right is a large screen LCD panel with a dynamic reactive animation film loop. This installation presents a dynamic time lapse still-life painting that shifts subtly caused by sensing personal characteristics of the participants via emotion detection within the gallery or by mobile app from remote locations. The body of work explores an autonomously responsive media delivery modified by detected and analyzed biometric data. In the exhibition space, the art works presented are a series of time lapse animated or filmed scenes that change with atmospheric, stylistic or other variable elements.


## All Roads Lead to the River

## $3.8^{\prime}$ wide, $6.2^{\prime}$ tall, $3^{\prime}$ deep

A free-standing work that has images and kinetic objects of both sides. One the front facing side the work mixes a painted image of a fractured landscape and a salvage traffic signal. The traffic signal tracks and rotates to follow the viewer as they move through the space. The system uses a webcam used for tracking and range finding sensors to identify a viewer's position and a microcontroller that manage the tracking of the viewer, and the control of a motor and gear system. As a viewer approaches the work the light is green, as they move closer the light changes to yellow, and finally to red.The traffic signal tracks the movement of an individual viewer and rotates to follow them as they move through the viewing space.



The rear facing side features a city map and miniature cars that travel in the map towards the river, but never are able to cross.

The work explores the metaphors of connective locations and obstruction. In our daily lives the illusion that easy transit is possible. Transit refers, in this case, to human endeavors. Rivers afford easy movement of goods and services. Roads and highways infer affordance of easy travel. As metaphors for ease of action in our personal lives these are powerful concepts. Yet these are continually obstructed by the traffic of ordinary existence within an overpopulated environment.


## Speed Limit

This work uses streamed media shot simultaneously from the front and rear directions of a moving automobile in traffic. The viewer stands between two large wide screen monitors, recreating the experience of the driver. A rear-view mirror is attached to the forward-looking screen, allowing the rear view of oncoming traffic to be seen.
(This work may not be possible for installation in the 263 Gallery space)


LED Matrix using touch sensors
dimensions: variable
In addition to works mentioned above, smaller LED matrices are proposed for display. These smaller LED matrices are test pieces used to test light patterns, software algorithms, and sensor control systems.
Each use sensors such as capacitive touch, soft potentiometers, ultrasonic range finders, light sensors to invoke light patterns and behaviors.

