

LeBrun

2020

CREDIT

- Art Direction
VR world building
Creative Coding / System Design
Weidi Zhang

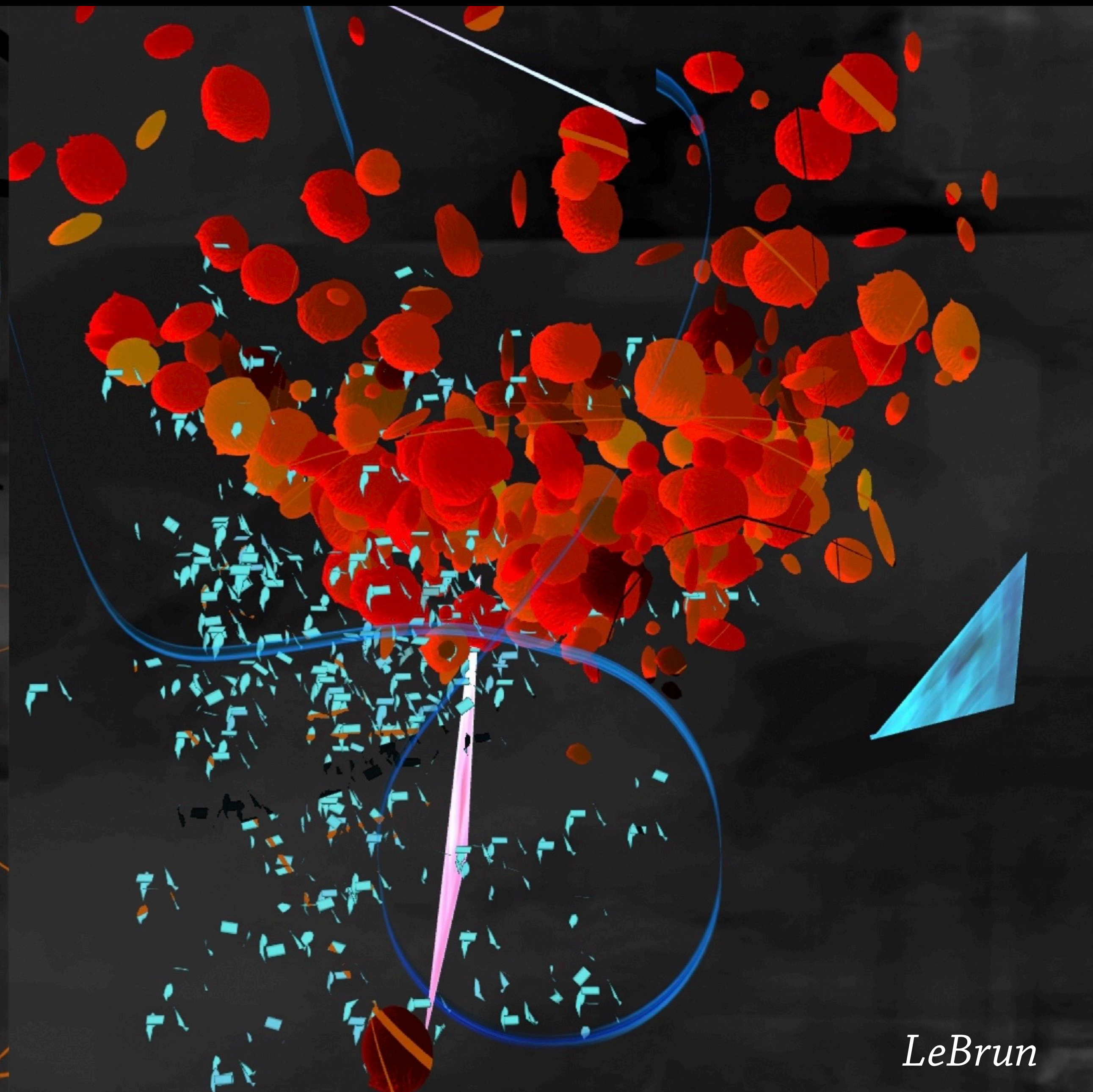
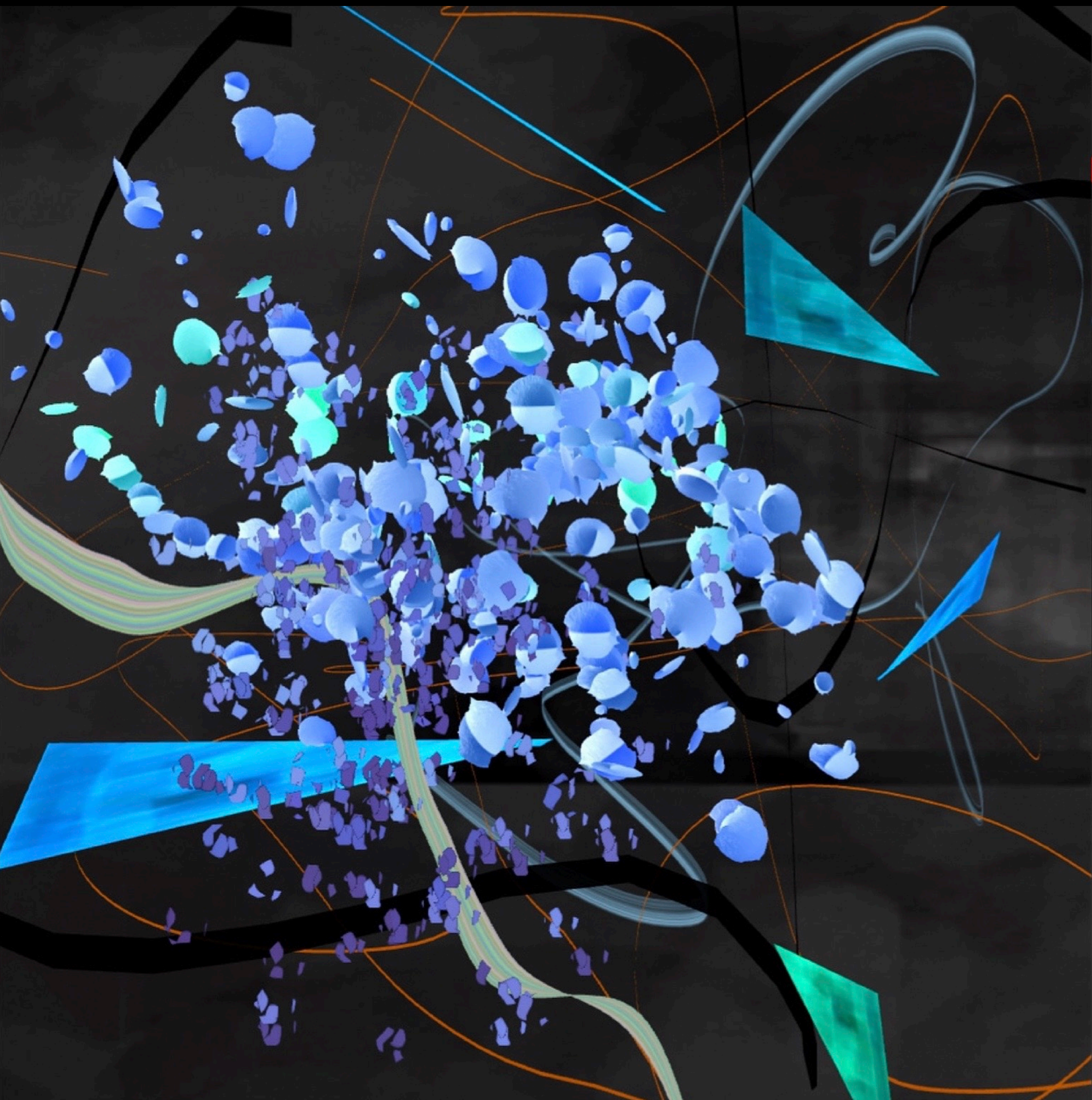
Intelligent System Implementation
Tool Design / Creative Coding
Jungah Son

MEDIUM

- Time Varied
Interactive Media Art Installation

SPECIAL THANKS

- Prof. Legrady and Experimental Vis Lab

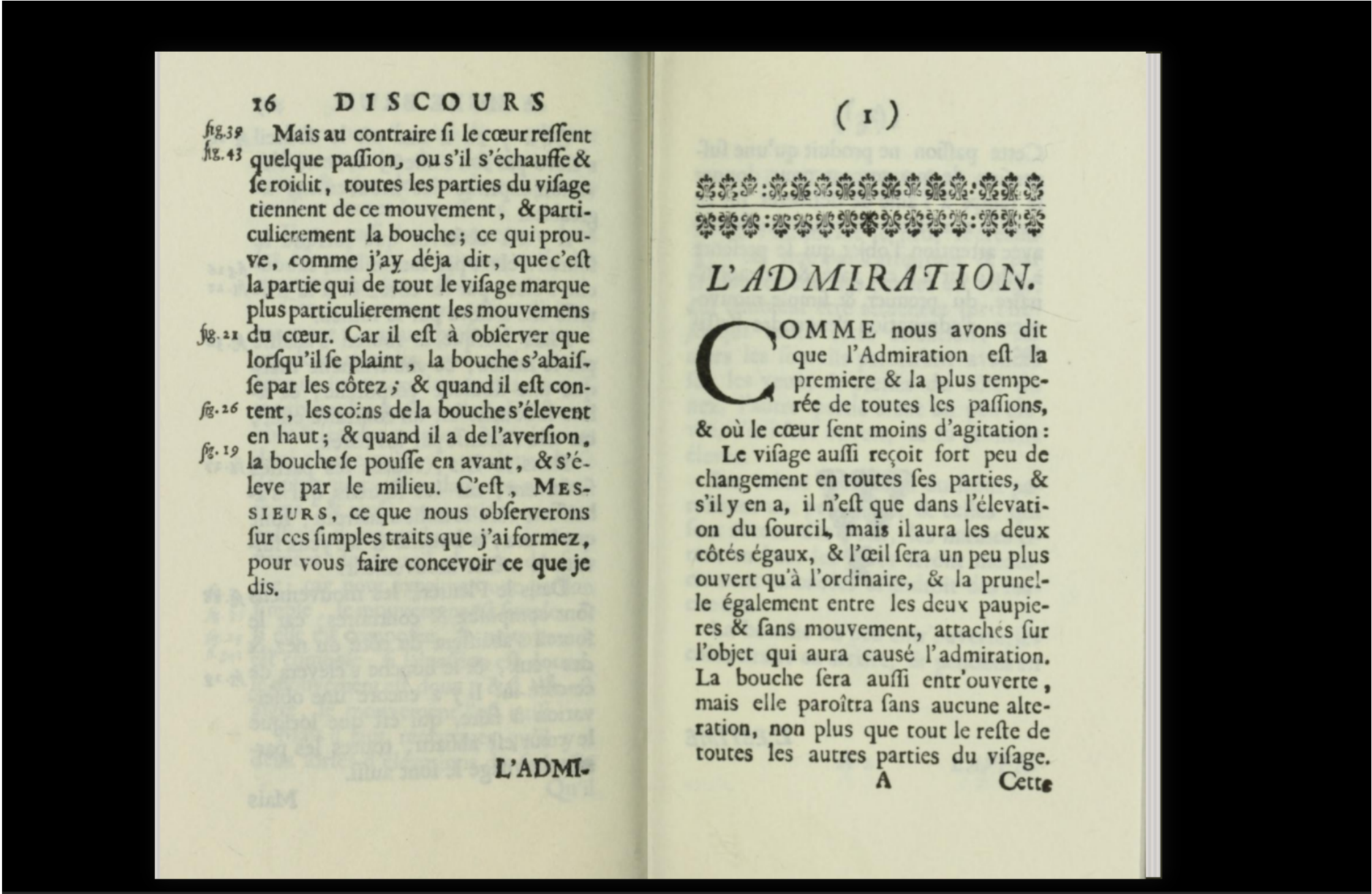


LeBrun

Introduce *LeBrun*



Portrait of Julie Le Brun, Charles Le Brun, 1792



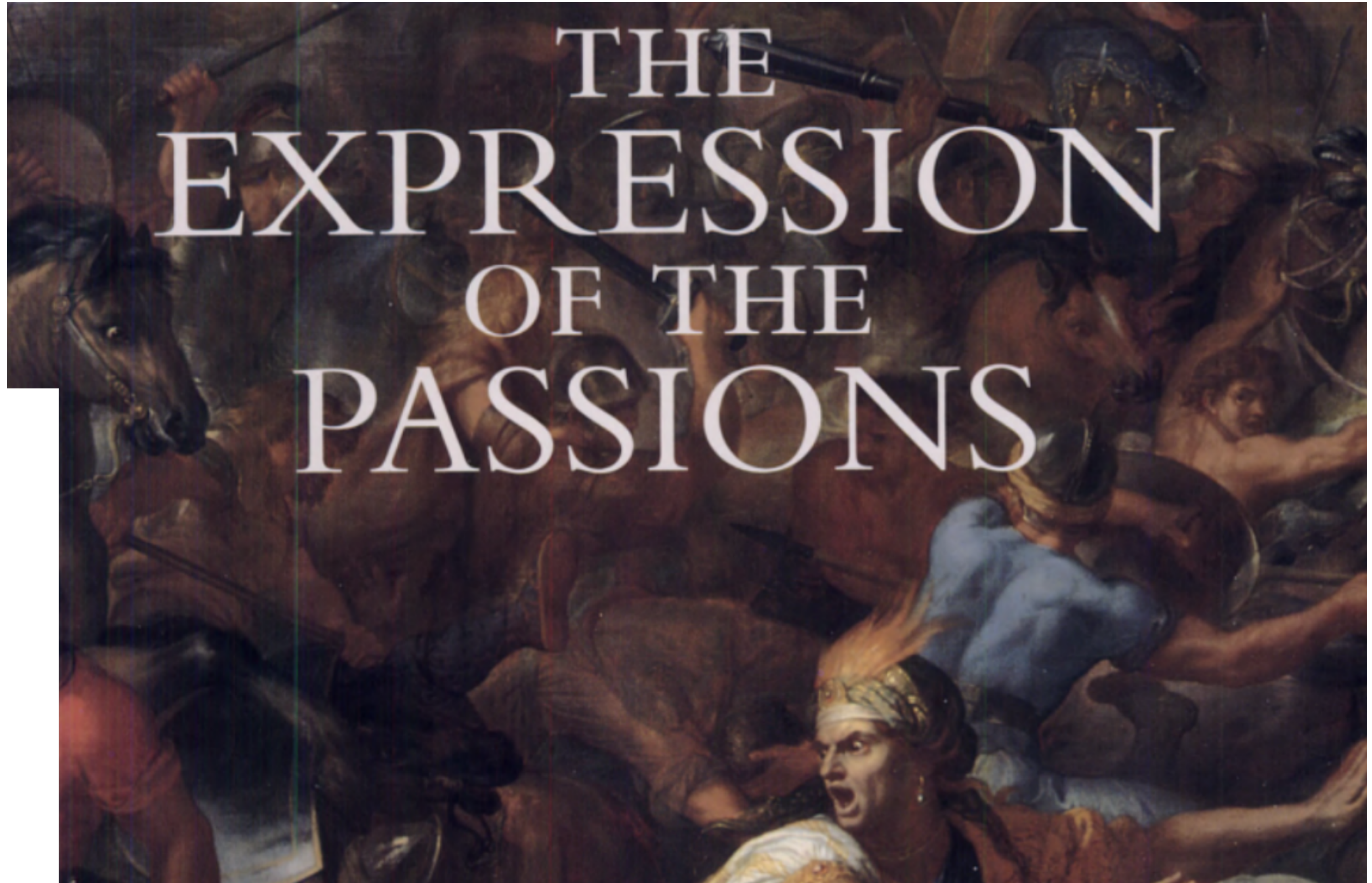
Charles Le Brun : *Methode Pour Apprendre A Dessiner Les Passions*

Introduce *LeBrun*

THE EXPRESSION OF THE PASSIONS

THE ORIGIN AND INFLUENCE OF
CHARLES LE BRUN'S
*Conférence sur l'expression
générale et particulière*

Jennifer Montagu



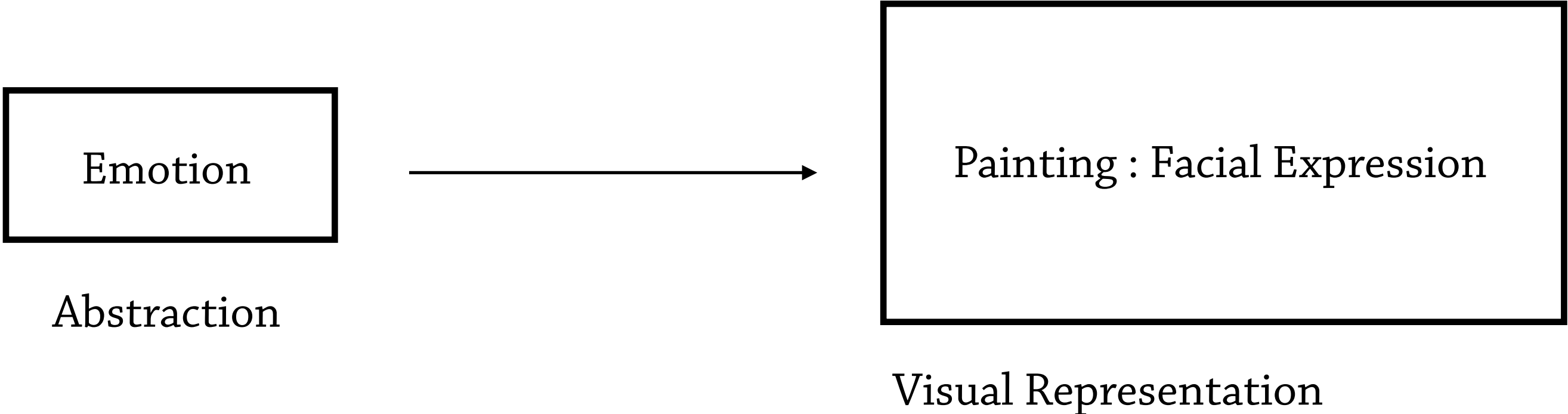
Introduce

LeBrun

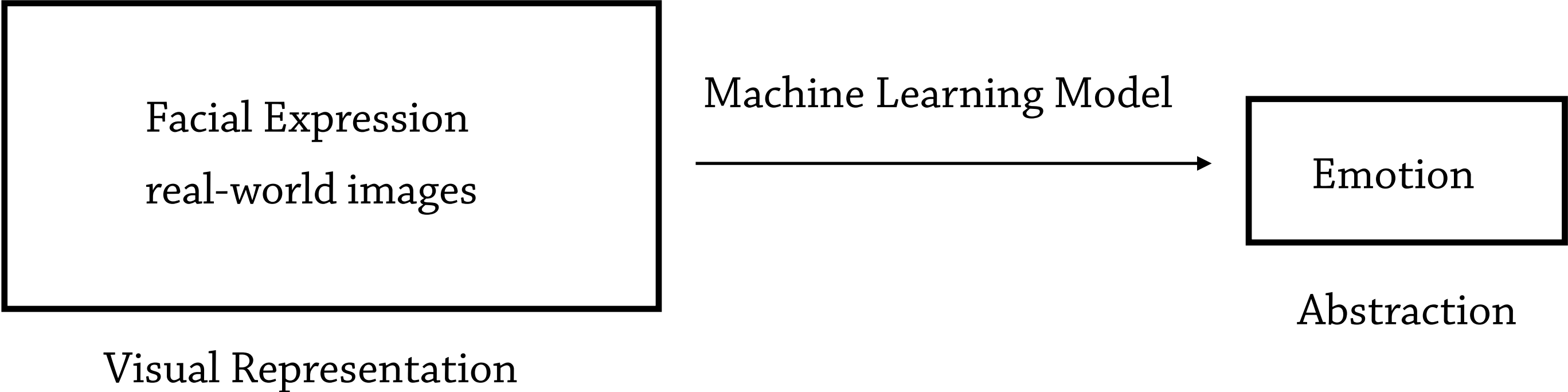
“Image is a constructed artifact rather than a document of the world.”

Introduce *LeBrun*

The painter : Charles Le Brun



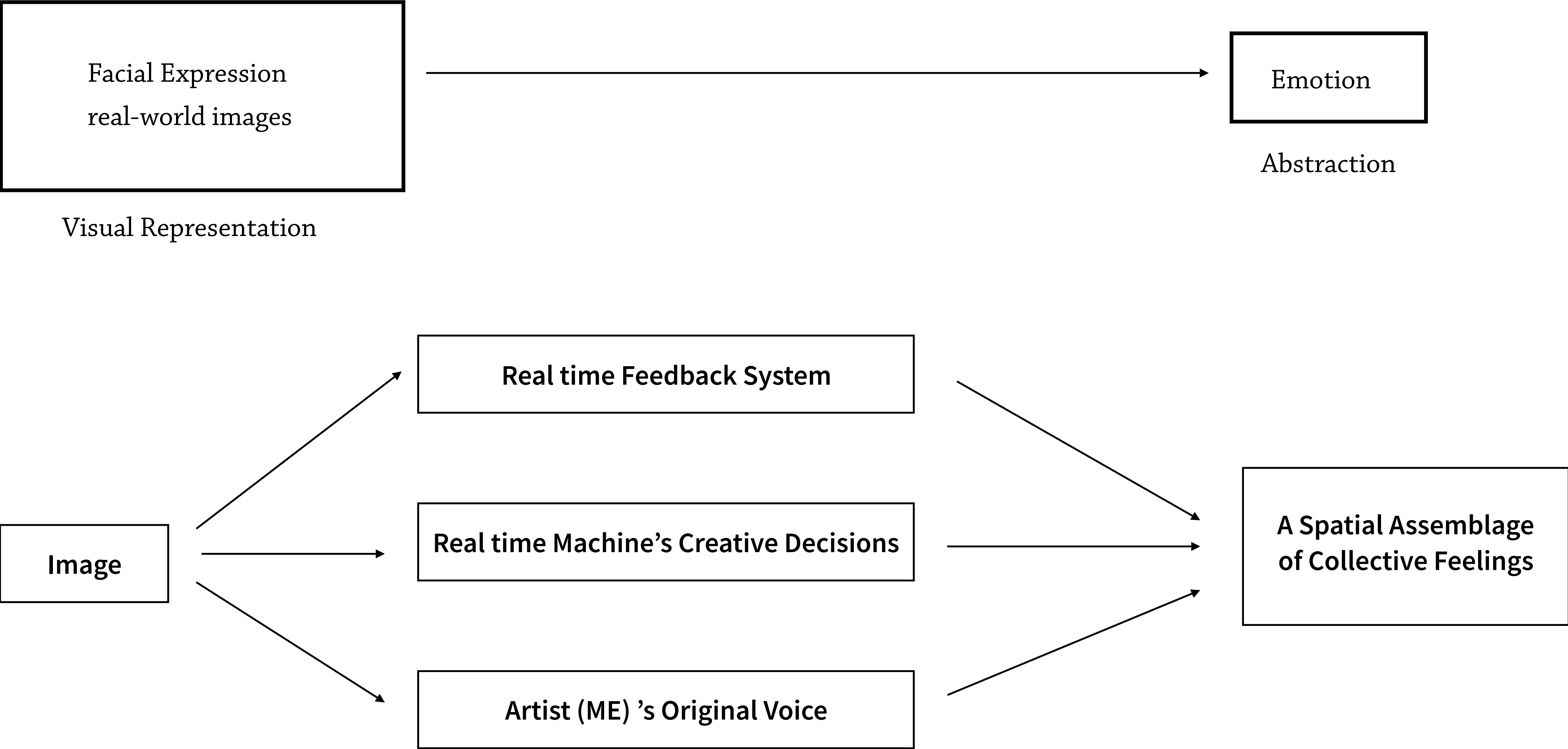
Our System : LeBrun



Introduce *LeBrun*

Everything flows and nothing abides; everything gives way and nothing stays fixed.
You cannot step twice into the same river, for other waters are continually flowing on.
It is in changing that things find repose. - Heraclitus

Introduce *LeBrun*



Introduce *LeBrun*

Emotion differs humans from intelligent machines. Don Norman, the author of *The Design of Everyday Things*, claimed that robots, to be successful, will have to have emotions. Current developments in artificial intelligence are on their way to achieve this by training neural network models on a large set of data. Datasets are built using various sensors to detect biometric signals such as voice, face, neuroimaging and physiological in affective computing. These signals are then classified to detect emotions using machine-learning algorithms. However, **our emotions are incredibly complex, which reflect psychological and physical changes which can not be simply categorized through features and data.**

Charles Le Brun (1619 – 1690), a famous French painter, creates dynamic and concrete facial expressions to reveal the soul and emotions. Reversely, we designed an intelligent system named *Le Brun* that uses image emotion recognition to estimate emotions of surroundings and create abstract art.

We trained the emotion prediction system based on the dimensional emotion model (V-A model) using GIST, VGG object, and semantic features as shown in Kim et. al's paper [ref]. *Le Brun* evaluates the images captured by the camera in real-time and makes creative decisions of a virtual experience that decodes emotions. It provides an imagination of potential future coexistence of humans and machines – an empathetic experience that is collaboratively created by humans and machines.

Emotional Machine *LeBrun*

The paper focus on two high level features, **the object and the background**, and assume that **the semantic information of images is a good cue for predicting emotion**.

The CNN has had a big impact especially in the image classification, and it is an effective network model for learning filters that capture the shapes that repeatedly appear in images. However, **the learning process for the image emotion prediction should be different from that of image classification**. This is because some images with different appearances can have same emotions, and some images with similar appearances can have different emotions.

the dimensional model for expressing the emotions, which is widely used in the field of psychology. Specifically, the dimensional model consists of two parameters, **Valence and Arousal** (Figure 2). **Valence represents the pleasure through the scale from 1 (negative) to 9 (positive)**. **Arousal is the level of excitement, which also ranges from 1 (calm) to 9 (excited)**.

Building Emotional Machines: Recognizing Image Emotions through Deep Neural Networks

Hye-Rin Kim, Yeong-Seok Kim, Seon Joo Kim, In-Kwon Lee

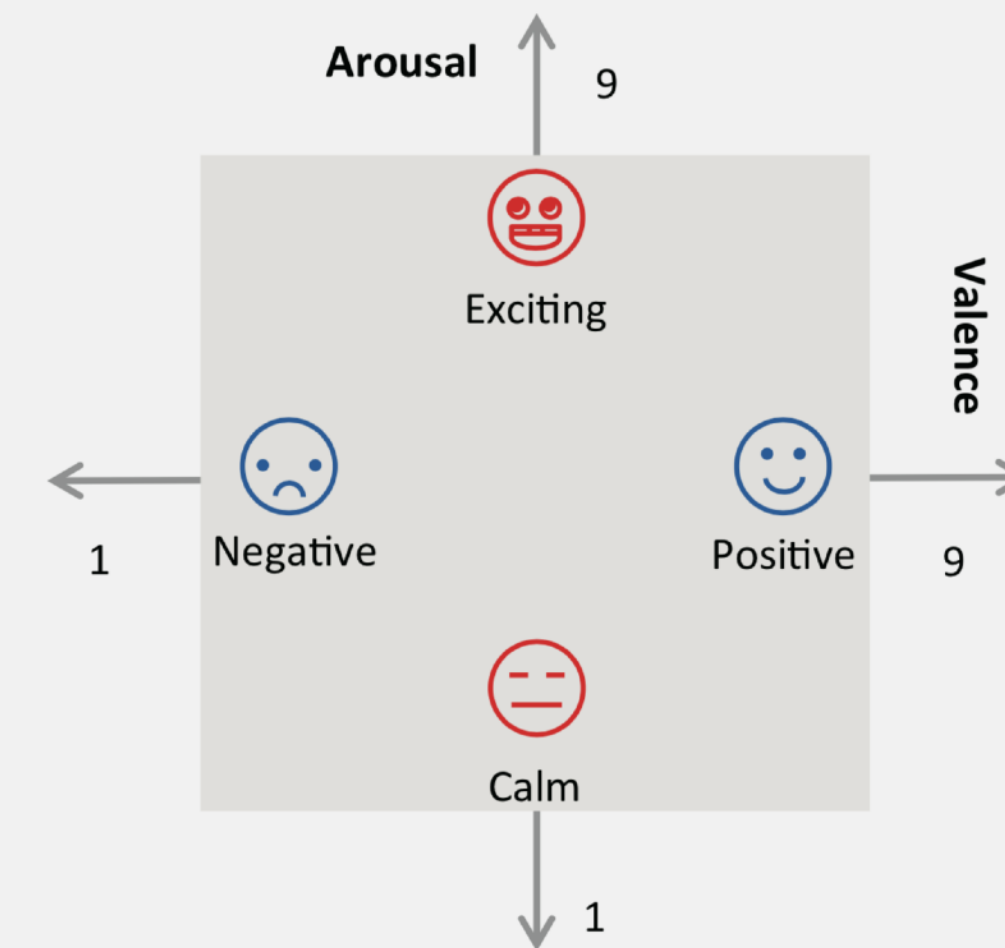
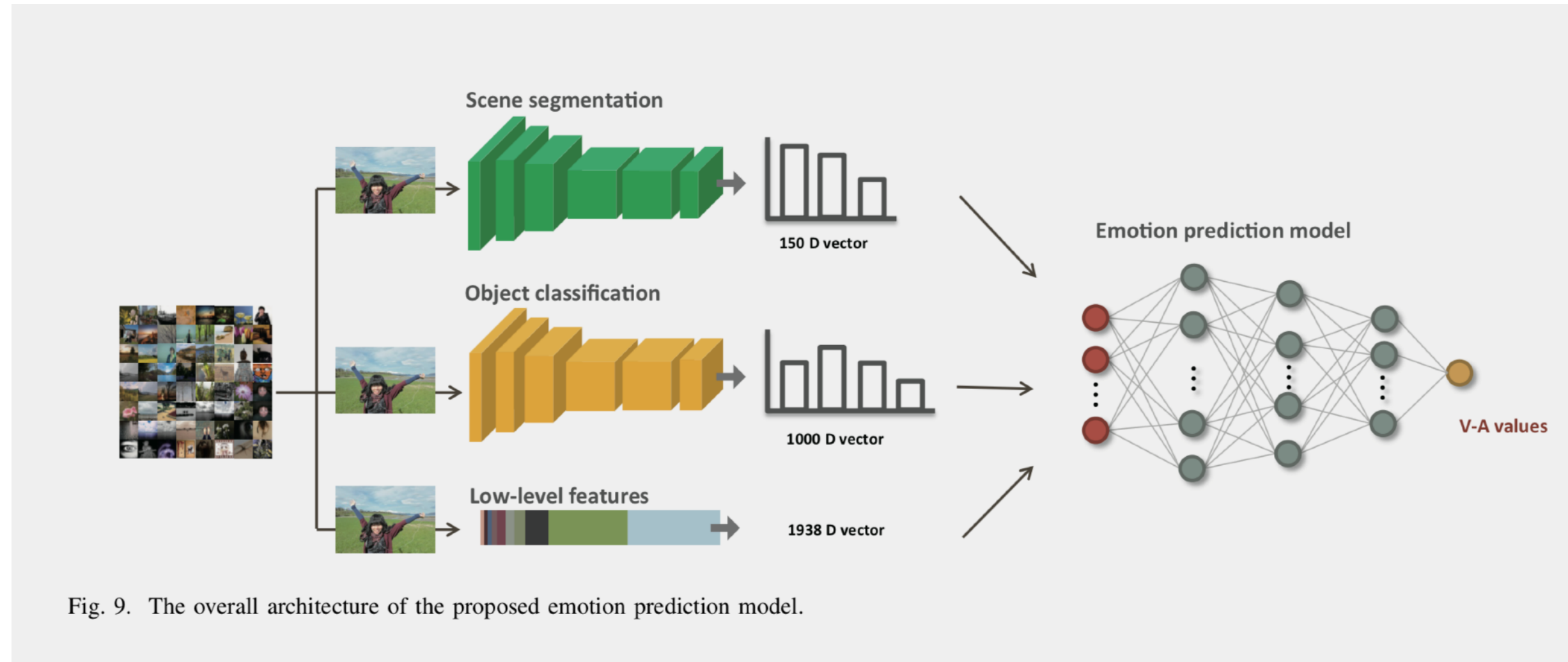


Fig. 2. Two dimensional emotion models (Valence and Arousal).

Building Emotional Machines

LeBrun



Building Emotional Machines: Recognizing Image Emotions through Deep Neural Networks

V. LEARNING EMOTION MODEL

In this section, we introduce the details of our emotion prediction framework. The overall architecture of our framework is shown in Figure 9. Our model is a fully connected feedforward neural network. In general, a neural network consists of an input layer, an output layer, and one or more hidden layers. Normally, when there are two or more hidden layers, the network is called deep network. Each layer is made up of multiple neurons, and the edges that connect neurons between adjacent layers have weights. The values of neurons (except the neurons in input layer) and weights are trained during a training phase.

Our network $F(X, \theta)$ including an input layer, three hidden layers and an output layer is as follows:

$$F(X, \theta) = f^4 \circ g^3 \circ f^3 \circ g^2 \circ f^2 \circ g^1 \circ f^1(X), \quad (4)$$

where X is input feature vector, θ is a set of weights including weights w and bias b , and f^4 produces the final output of our neural network (Valence and Arousal value).

Specifically, given an input vector $X^l = [x_i^l, \dots, x_n^l]^T$ in layer l , the preactivation value p_j for the neuron j of layer $l + 1$ is obtained through function f^{l+1} :

$$p_j^{l+1} = f^{l+1}(x^l) = \sum_{i=1}^n w_{ij}^{l+1} x_i^l + b_j^{l+1}, \quad (5)$$

Building Emotional Machines

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extract a various type of features
for emotion prediction

measure the value of pleasure, arousal, and dominance through experiments. The formula for computing the values is as follows:

$$Pleasure = 0.69Y + 0.22S \tag{1}$$

$$Arousal = 0.31Y + 0.60S \tag{2}$$

$$Dominance = 0.76Y + 0.32S \tag{3}$$

We measure the values for the three elements from the image and use them as features.

Color Features



Local Features



GIST Feature Extraction

Object Features



CNN (**AlexNet**, **VGG16**, and **ResNet**) object feature is the result of the final output layer, and it represents the probabilities of 1000 object categories.

Semantic Features



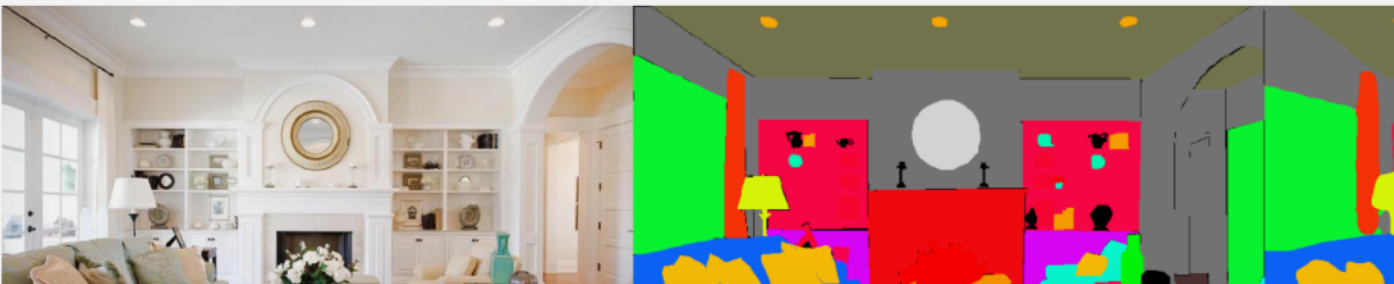
a semantic segmentation method based on a deep network, which classifies each pixel of an image into one of 150 semantic categories.

ADE20K is the largest open source dataset for semantic segmentation and scene parsing. Follow the link below to find the repository for our dataset and Torch7: <https://github.com/CSAILVision/sceneparsing>

If you simply want to play with our demo, please try this link: <http://scenesegmentation.com> and parse your own photo and parse it!

You can also use this [colab notebook playground here](#) to tinker with the code for segmentation.

All pretrained models can be found at: <http://sceneparsing.csail.mit.edu/model/pytorch>



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Fig. 5. Example images in our database. From left to right side, the valence value of the image increase. The images on the left/right have negative/positive emotion. From bottom to top, the arousal value of the image increase. The images on the bottom/top have the calm/exciting emotion.

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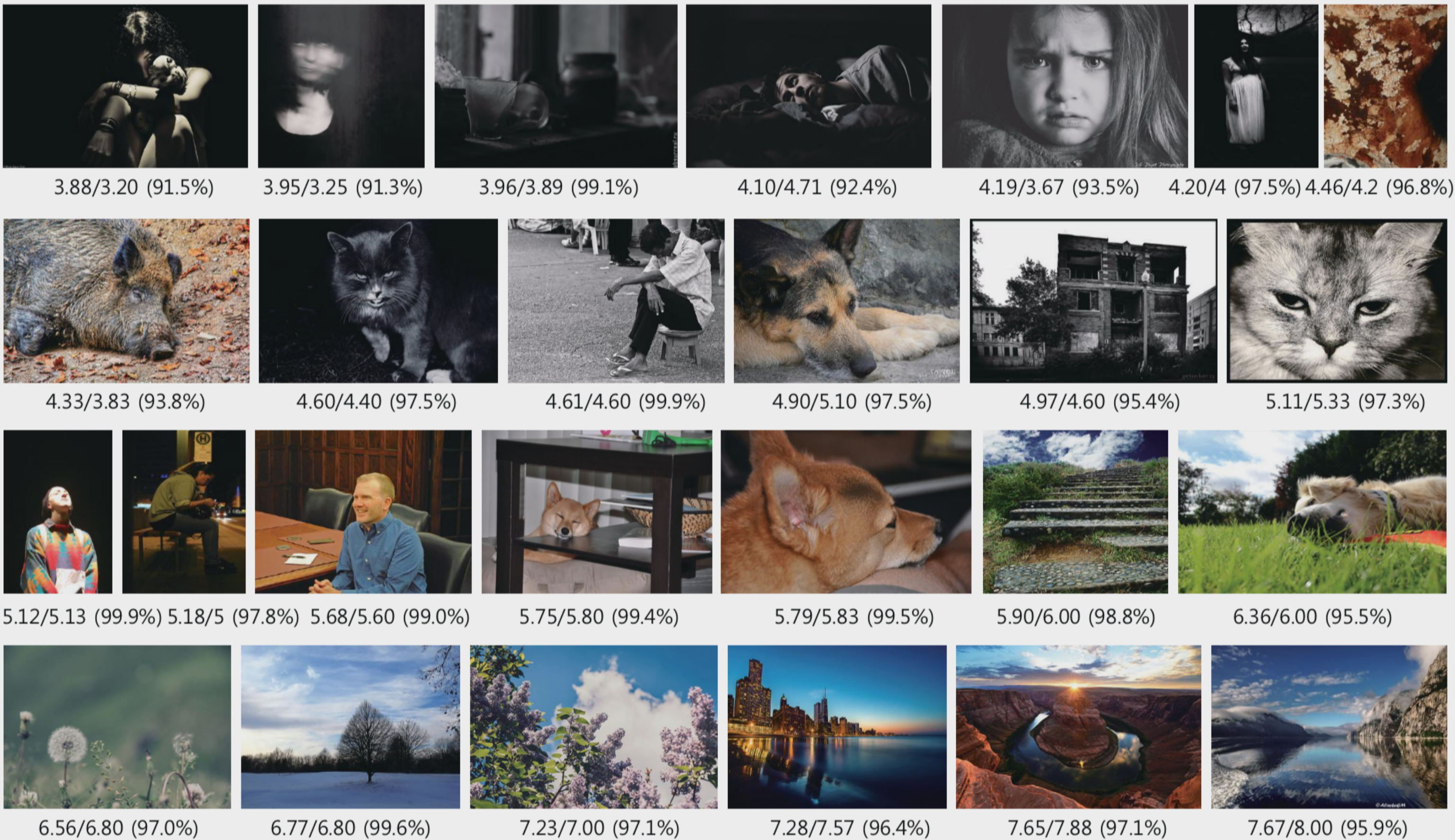
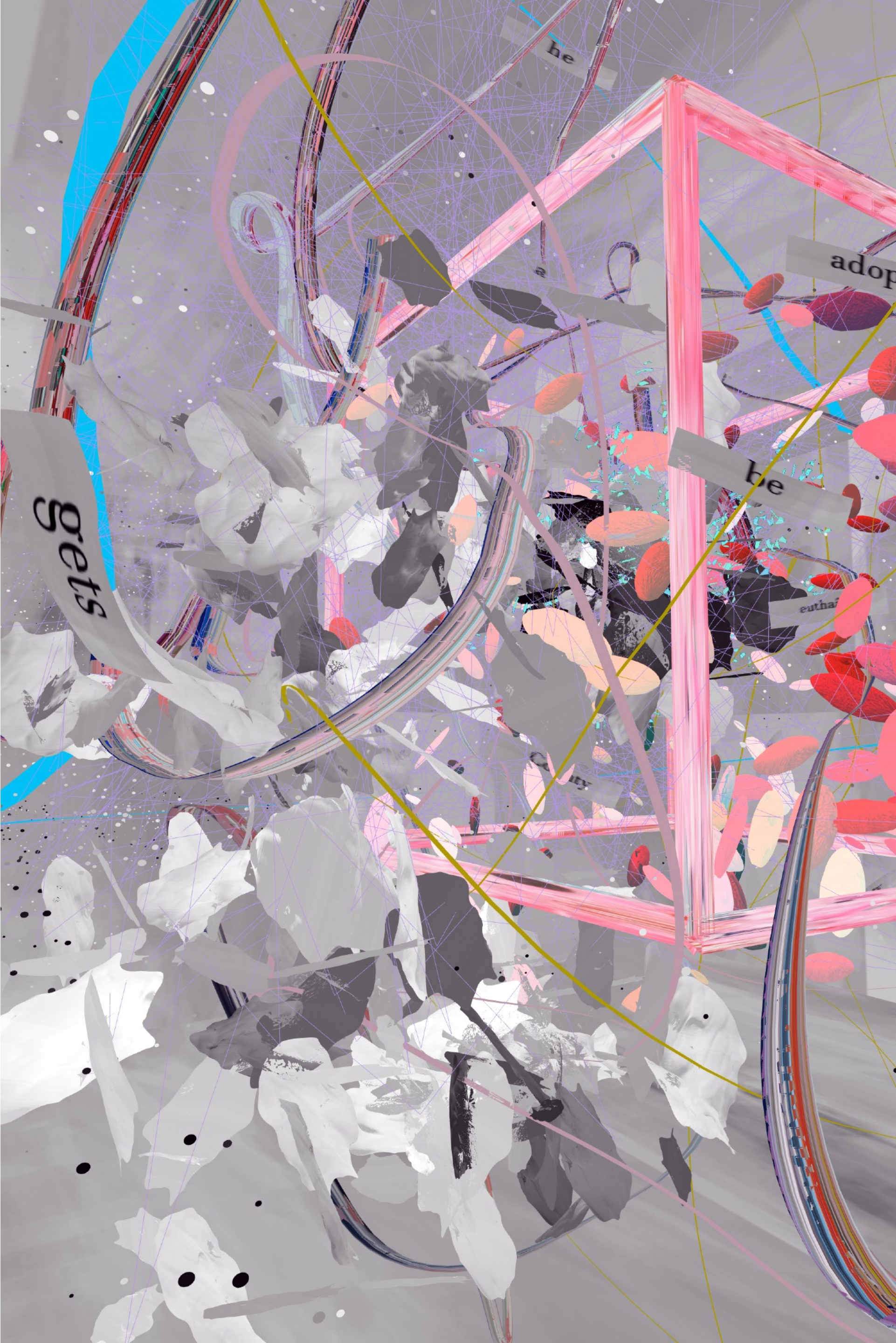


Fig. 11. Valence prediction results of the images with low arousal. The values below each image represent the predicted valence value and ground truth value (prediction/ground truth). The prediction accuracy result is also shown. From the top left to the bottom right, the value of valence increases. All images in this example have low arousal values.

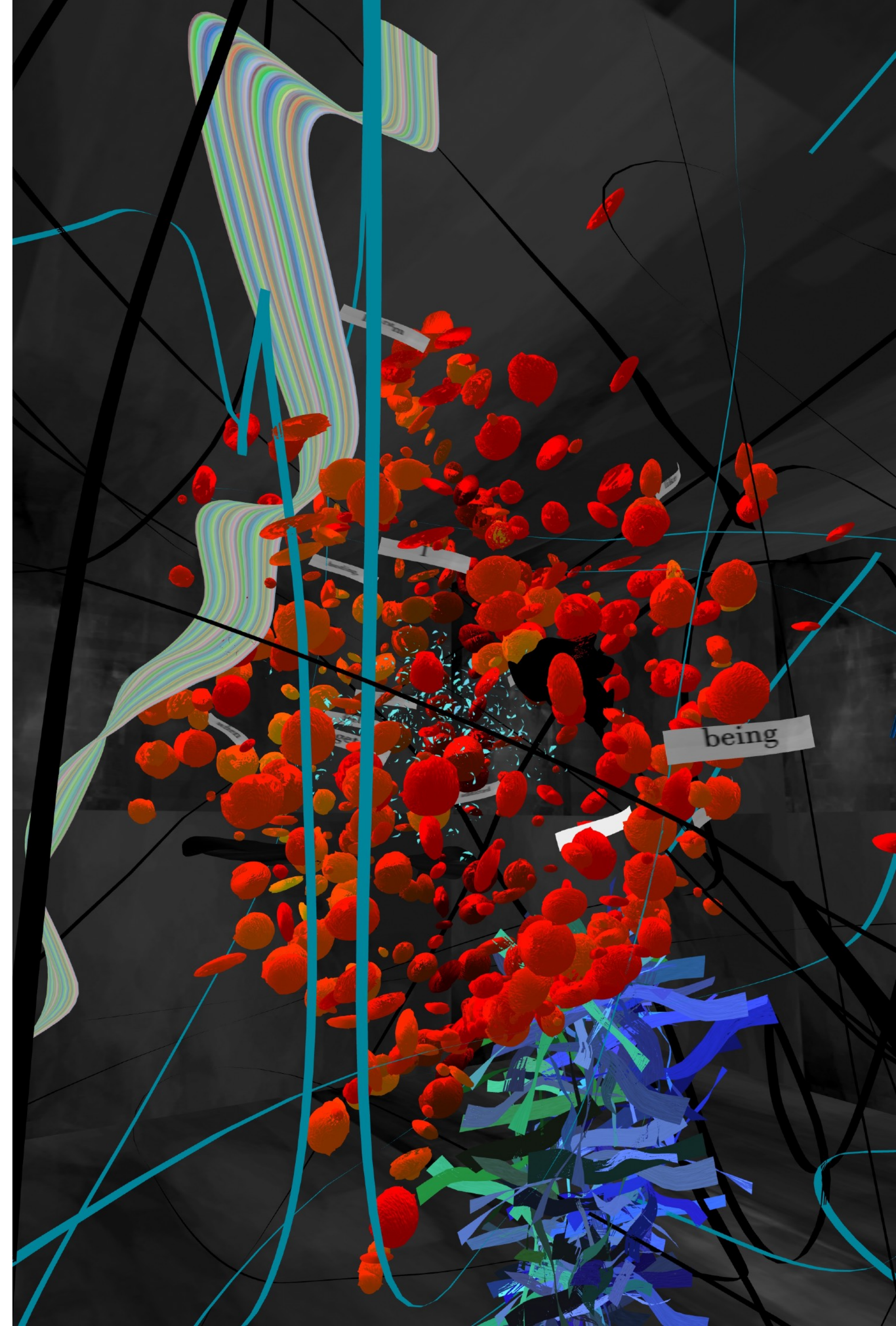
Work in Progress

LeBrun

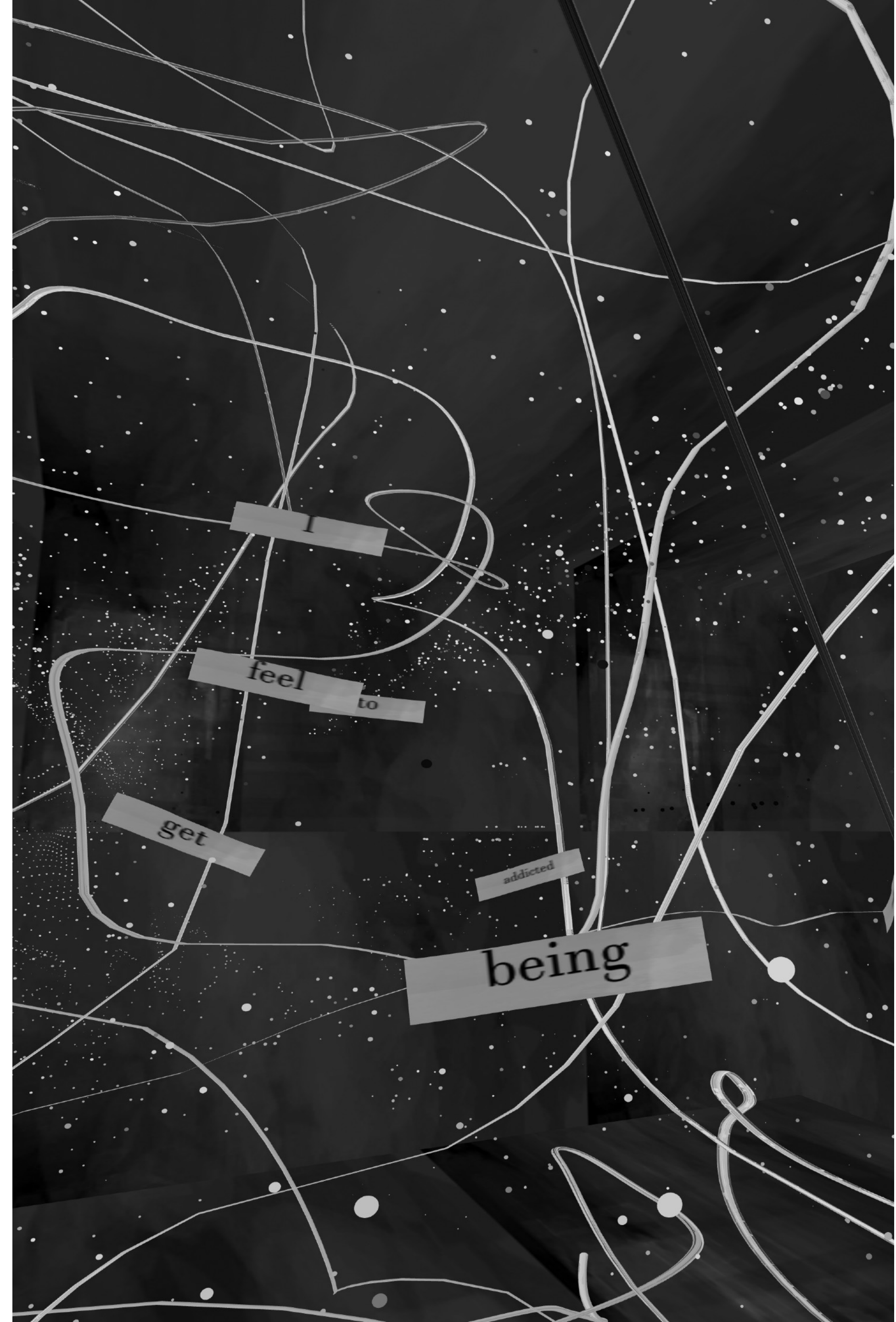
Stop putting yourself down. Stop doubting how far you’ve come. Stop regretting the choices you’ve made. Satan will... http
If you're a student and struggling, if you feel anxious or depressed , then take advantage of these fabulous and F... https://t
Im addicted to hustling, I get depressed when i feel like I’m not being productive
so who else is feeling depressed tonight
Does anyone in Orange County want to be a hero and adopt a very sweet but sad ginger/tabby cat before he gets eutha... h
Been feeling really depressed these past few days, i want to take a break for a bit from streaming but i'm terrifle... https://t
Me when I walk pass a happy couple knowing I’m single depressed and almost losing it ! https://t.co/41jEIWeIm8
Riot seem to have made a series of odd decisions around LoL's new character, Seraphine. Like making her a depressed... htt
An undocumented 19yo who cannot apply for DACA (Trump administration stopped processing new applications) messaged.
Sometimes I sit down at my desk and feel so crushingly depressed about the state of our nation and then I remember... jus
My latest for @CNN tackles an issue near and dear to my heart: fatherhood. As @jidebam and his team discovered, if... http
A lot of people don’t like to tell their doctor theyre depressed because the medical records can come back to haunt... https:/
Why am I depressed following #BarrettConfirmationHearing? Because when democracy degrades in US & their SCourt
A biscuit company which depressed sales to cut up to 10,000 jobs (then went on to reap windfall profits through rec... https
Trump WH and campaign staff are deeply depressed knowing he’s Covid-positive, physically weak, mentally unstable &



Work in Progress *LeBrun*



Work in Progress *LeBrun*



To Be Continued..... *LeBrun*