

# ARTIFICIAL NEURAL NETWORK BASED SMELL SIMULATOR FOR VISUALIZATION

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**Abstract**—The continued progress towards higher resolution screens is a treat for your eyes, but what of your poor nose? It's left out of the experience on the screen, and that's a shame [2]. Scent can be the powerful simulator of memory and emotion. In this paper we propose a novel idea of artificial "smell" simulator. The proposed smell simulator is based on artificial neural network. In the following section we present previous work in smell-O-vision, and the concept of neural network, problem faced in the current system and finally the proposed system.

**Index Terms**— Artificial Neural Networks, Odour Producing Machine, Smell-O-Vision, Smelling Screen, Smell Simulator.

## I. INTRODUCTION

The continued progress towards higher resolution screens is a treat for your eyes, but what of your poor nose? It's left out of the experience on the screen, and that's a shame [2].

Scent can be the powerful simulator of memory and emotion.

In this paper we propose a novel idea of artificial "smell" simulator. The proposed smell simulator is based on artificial neural network. In the following section we present previous work in smell-O-vision, and the concept of neural network, problem faced in the current system and finally the proposed system.

## II. NEURAL NETWORKS

An Artificial Neural Network (ANN) is an information processing paradigm that is inspired by biological neural networks [4].

It is composed of a large number of highly interconnected processing elements called neurons [4].

An ANN is configured for a specific application, such as pattern recognition or data classification [4].

It has the ability to extract patterns and techniques. It also has the ability of adaptive learning and real time applications[4].

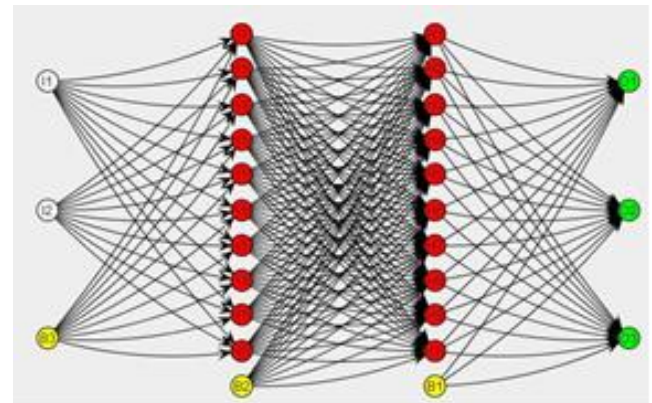


Figure 1: Artificial Neural Network

## III. RESEARCHES MADE ALREADY

Smell-o-vision has been on the tech industry's radar for what seems like forever now, and made its first widespread appearance over 50 years ago in the conveniently titled 1960 film *Scents of Mystery* [1].

However, there are documented cases of scents being used in conjunction with theatre dating back to over 100 years ago. Cotton was soaked in rose oil, and then placed in front of a fan in order to waft the scent around.

A bit of cotton soaked in one specific oil isn't dynamic, though, and can't change scents based on what is happening on-screen [1].

Fortunately, this isn't difficult to overcome.

A typical Smell synthesizer is essentially a box of various scented oils with some kind of spreading mechanism, like a fan. The box receives a signal from, for example a video game which tells to release an apple scent. Like in laser printer, this produces all the colours from the three basic colours (Red, Blue and Green). So, if single apple-scented oil isn't available, other oils would mix to create something close to that desired apple scent.

## IV. ADVANCES TILL DATE

Haruka Matsukura and a team of colleagues at Tokyo University of Agriculture and Technology, had created the display is called the 'smelling screen,' and dispenses with the need for an extra box full of oil.

As *New Scientist* points out, the display is a standard LCD, but has an air stream in each corner of the screen. From those screen corners, gel pellets are vaporized and sent into the air

streams, which are then sent out to the specific portions of the screen via fans.

The power and direction of the fans are efficient enough to send, for example, the smell of fried chicken to the drumstick displayed at the bottom of the screen.

#### IV. PROBLEMS FACED IN CURRENT SYSTEM

Currently, there are delayed actions between the specific scenery and the scents, and the mechanisms made a loud noise while releasing the scents [4].

Also, the smell-o-vision can only produce one scent at a time, but the proposed artificial smell simulator could create interchangeable cartridges so you can easily swap out which smells you want your display to produce and the delays are reduced due to the use of high speed neural networks.

#### V. PROPOSED SYSTEM

The proposed artificial smell simulator system consists of the following modules.

IMAGE CAPTURE.

IMAGE PROCESSOR.

FPGA BASED NEURAL NETWORK.

ODOR PRODUCING MACHINE.

**IMAGE CAPTURE:** The image capture captures the image from any video and it takes the still from the video.

**IMAGE PROCESSOR:** The Image processor identifies the image by processing it.

**FPGA BASED NEURAL NETWORK:** The neural network is trained and programmed to select the smell based on the captured image. It is implemented on FPGA.

**ODOR PRODUCING MACHINE:** The odour producing machine produces the scent of the given input image by the combination of different aroma oils.

#### VI. CONCLUSION

The proposed artificial neural network based artificial smell simulator can become more prevalent in consumer homes, and we can even literally stop and Smell any 'articles' in the games we play and shows we watch. TV's and theatres are the first targets, but in time even the phone in your pocket could be-come more fragrant.

#### REFERENCES

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- [4] [en.wikipedia.org/wiki/Smell-O-Vision](http://en.wikipedia.org/wiki/Smell-O-Vision)

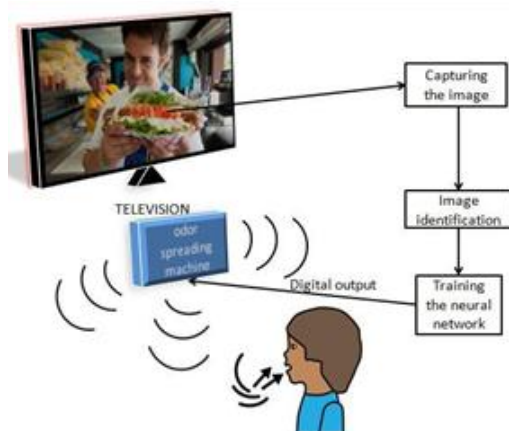


Figure 2. Block Diagram for Artificial Smell Simulator