Computation

Kallam Tarun Kumar Reddy

June 23, 2025

Contents

List of Figures

List of Algorithms

Abbreviations

TFT - Thin Film Transistor.

AMD - Advanced Micro Devices Inc.

MOSFET - Metal Oxide Semi-Conductor Field Effect Transistor.

ADC - Analog to Digital Converter.

SoC - System on a Chip

SMT - Surface Mounted Technology.

IC - Integrated Circuit.

ASIC - Application Specific Integrated Circuit.

ML - Machine Learning.

AI - Artificial Intelligence.

GOAP - Goal-Oriented Action Planning.

FT - Fourier Transform.

FFT - Fast Fourier Transform.

Chapter 1

Overview

1.1 Introduction

This chapter concerns itself with the equations necessary for doing computations in an orgahic die made from sesame seed oil.

1.2 Variables used in the derivation

The variables available at hand are charge of the electron which I denote it with 'C' in this chapter. Length of the block as 'l'. Breadth of the block as 'b'. Instant of time as 't'. Mass of the electron as 'm'.

However time 't' can be ignored if needed.

1.3 Images to help visualization

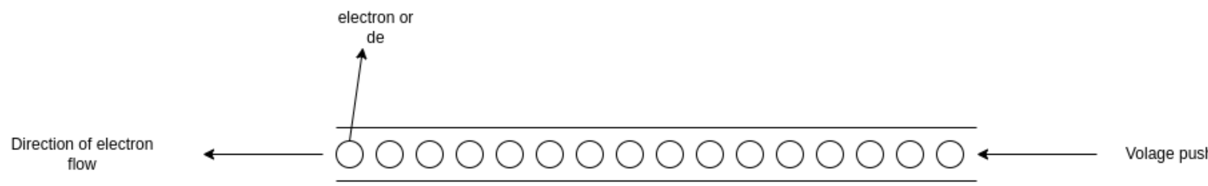

Figure 1.1: A visual for the basis of the derivation and for visualizing in a 2D fashion what happens when electricty is passed through the organic layer

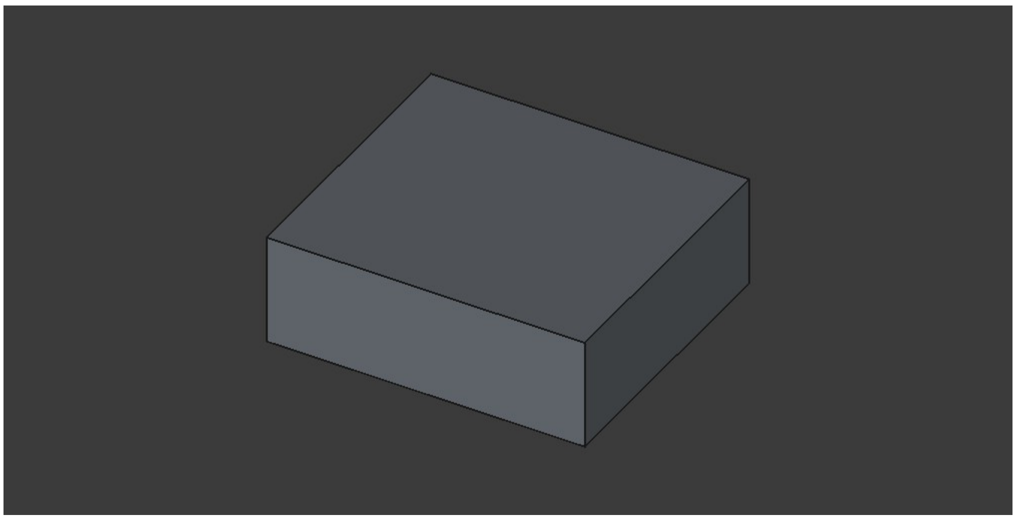

Figure 1.2: A view of the 3D block

1.4 Derivation

1.4.1 Basic electrical equations and their derivations in the context of the organic liquid layer

Let us start with the elemental parts of the problem we have:

Definition of elemental terms

C - Charge of the electron.
x - X - coordinate of the electron (e^-).
y - Y - coordinate of the e^-.
z - Z - coordinate of the e^-.

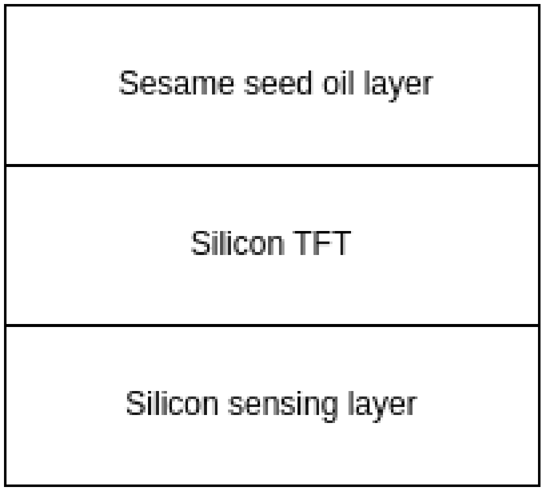

Figure 1.3: The proposed SoC stack

Electric Charge (E)

Taking the basics into account,

$$E = C \times Area$$

Area in the above context is the area of the object. Please note here that, in this case, an e^{-} is being considered. As such, the area is not being considered. To accomdate such a change, the equation is turned into:

$$E = C \times r$$

Where, r is radius of the electrical field. Since, r can be seen as negligible as radii of e^{-}s are most of the times in picometer,

$$lim_{r\to 0}E = lim_{r\to 0}(C \times r)$$
$$lim_{r\to 0}E = C \times lim_{r\to 0}r$$
$$E = C \times 1$$
$$E = C$$

Voltage (V)

$$V = E = C$$

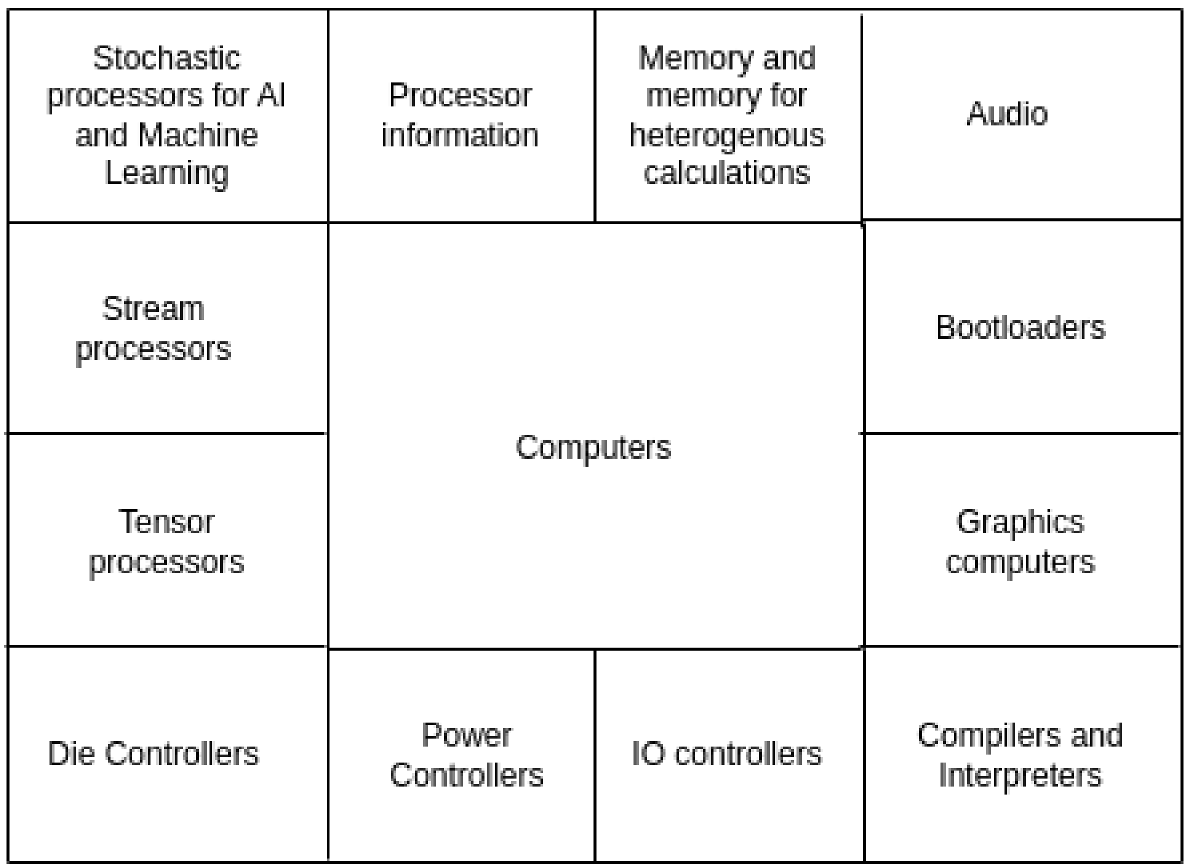

Figure 1.4: Proposed SoC layout

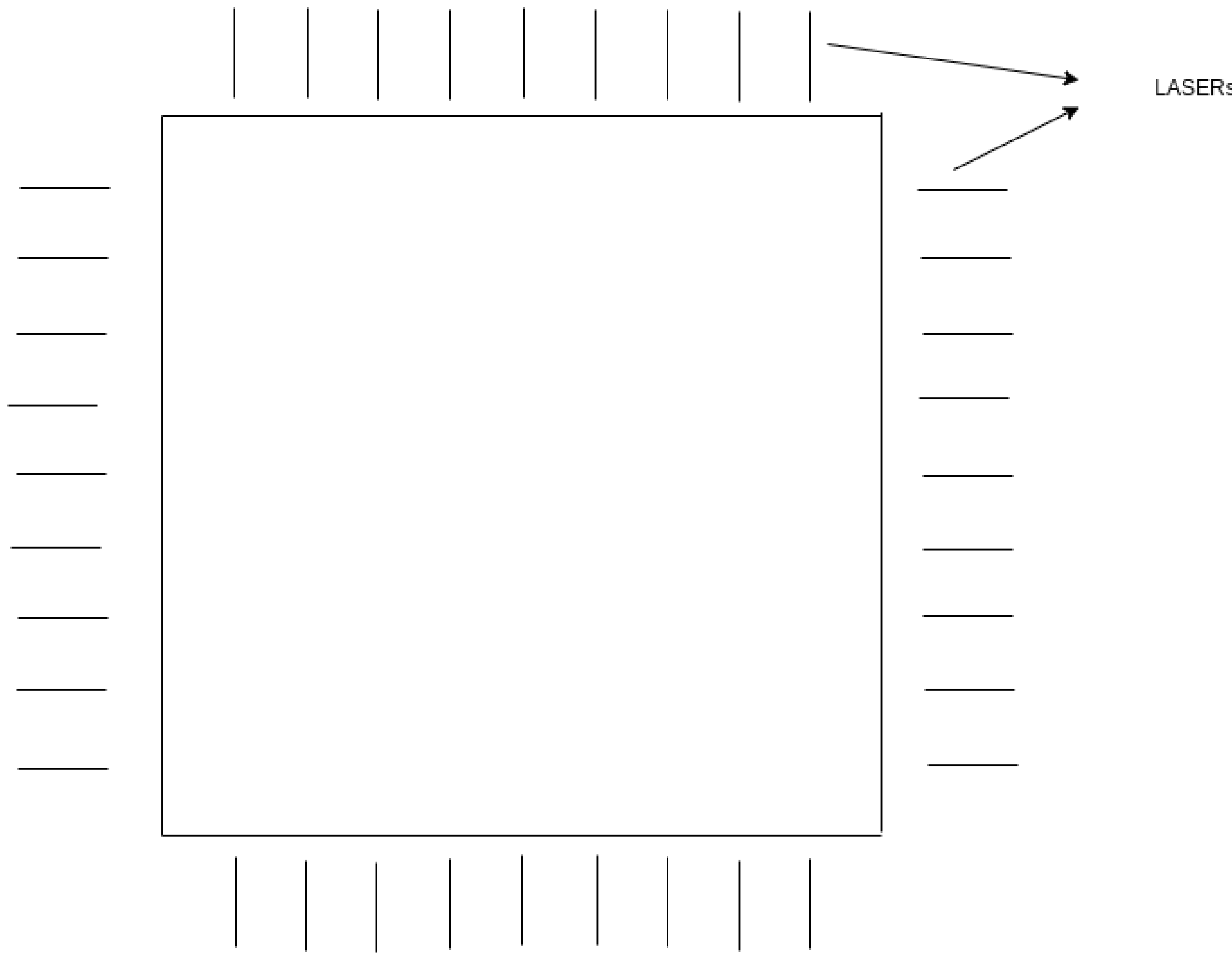

Figure 1.5: Proposed LASER layout for detetction by AMD

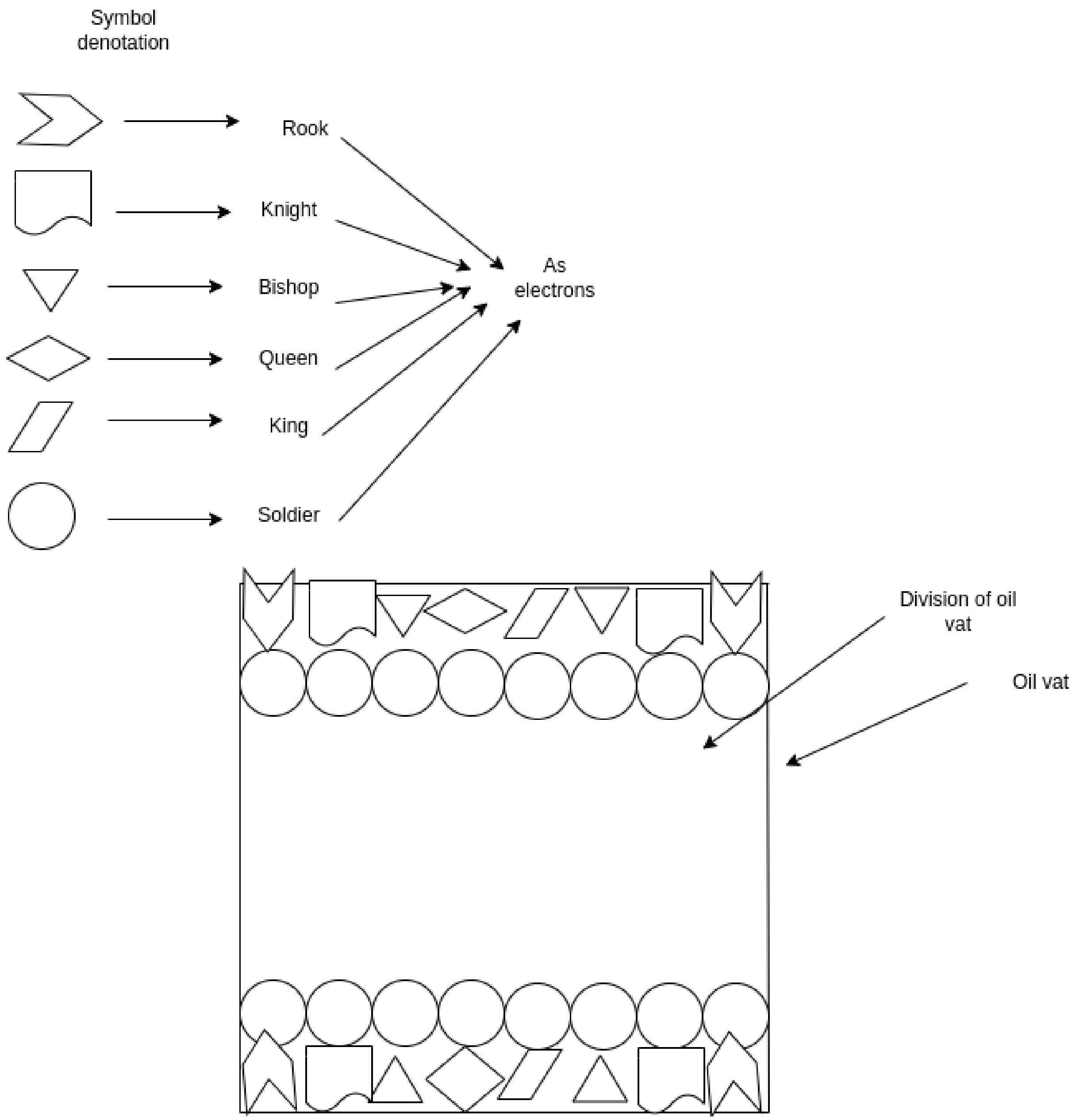

Figure 1.6: A visualization of the oil vat and the electrons as chess pieces

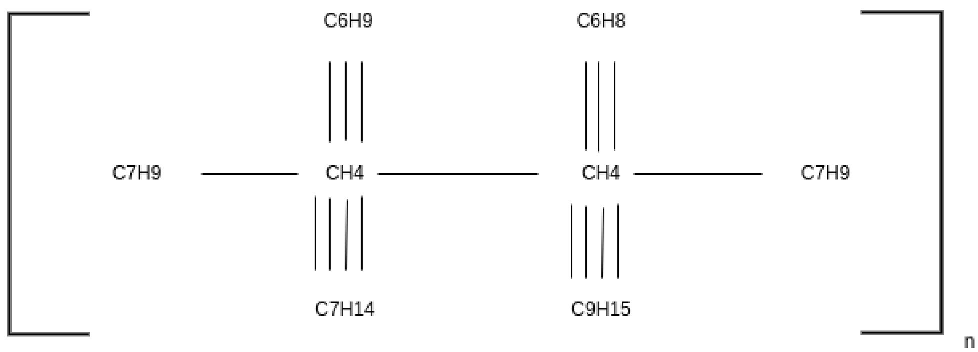

Figure 1.7: A visualization of the polymer and the compound

Current (I)

$$V = I \times R$$
$$I = \frac{V}{R}$$

R = visocity of the medium. Since, it is a liquid.

$$I = \frac{E}{\frac{m}{\frac{lb}{t}}} = \frac{C}{\frac{m}{lbt}} = \frac{Clbt}{m}$$

Distance travelled by the e^- (D):

$$D(x, y, z) = (x + dx) \times (y + dy) \times (z + dz)$$
$$= (xy + xdx + ydx + dxdy) \times (z + dz)$$
$$= xyz + xzdy + yzdx + zdxdy + xydz + xdydz + ydxdz + dxdydz$$

$$\iiint D(x, y, z) = \iiint (xyz)\, dxdydz + \iiint (xz)\, dxdzdy + \iiint (yz)\, dxdydz + \iiint z\, dzdydx$$
$$+ \iiint (xy)\, dxdydz + \iiint x\, dxdydz + \iiint y\, dydxdz + \iiint\, dxdydz$$

$$D(x, y, z) = \frac{x^2}{2} \times \frac{y^2}{2} \times \frac{z^2}{2} + \frac{x^2}{2} \times \frac{z^2}{2} \times y + x \times \frac{y^2}{2} \times z + \frac{x^2}{2} \times y \times z + xyz$$
$$= \frac{x^2y^2z^2}{8} + \frac{x^2z^2y}{4} + \frac{xy^2z^2}{4} + \frac{xyz^2}{2} + \frac{x^2y^2z}{4} + \frac{x^2yz}{2} + \frac{xy^2z}{2} + 8xyz$$
$$= \frac{x^2y^2z^2 + 2x^2z^2y + 2xy^2z^2 + 4xyz^2 + 2x^2y^2z + 4x^2yz + 4xy^2z + 8xyz}{8}$$

Speed is analogus to Current in electrical terms. So,

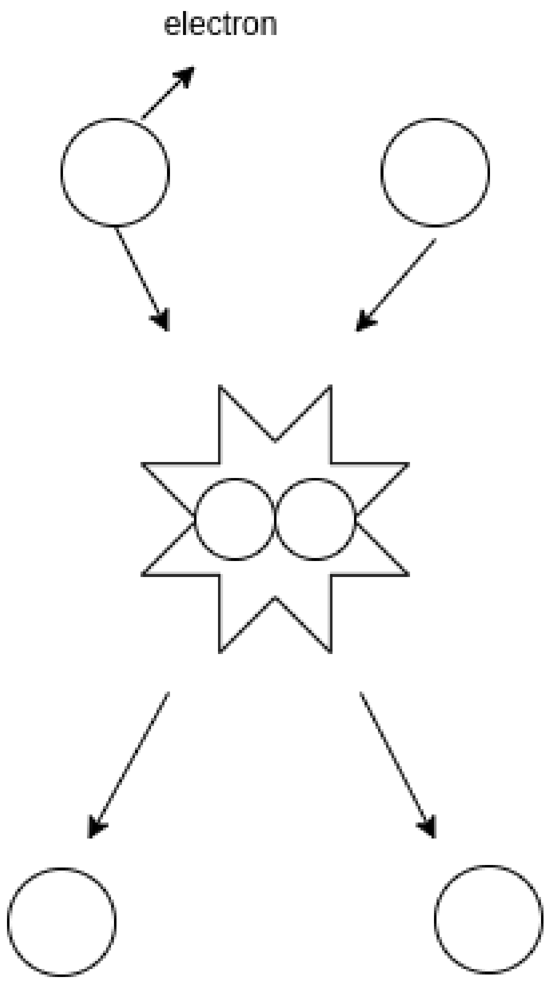

Figure 1.8: A diagram showing the collision

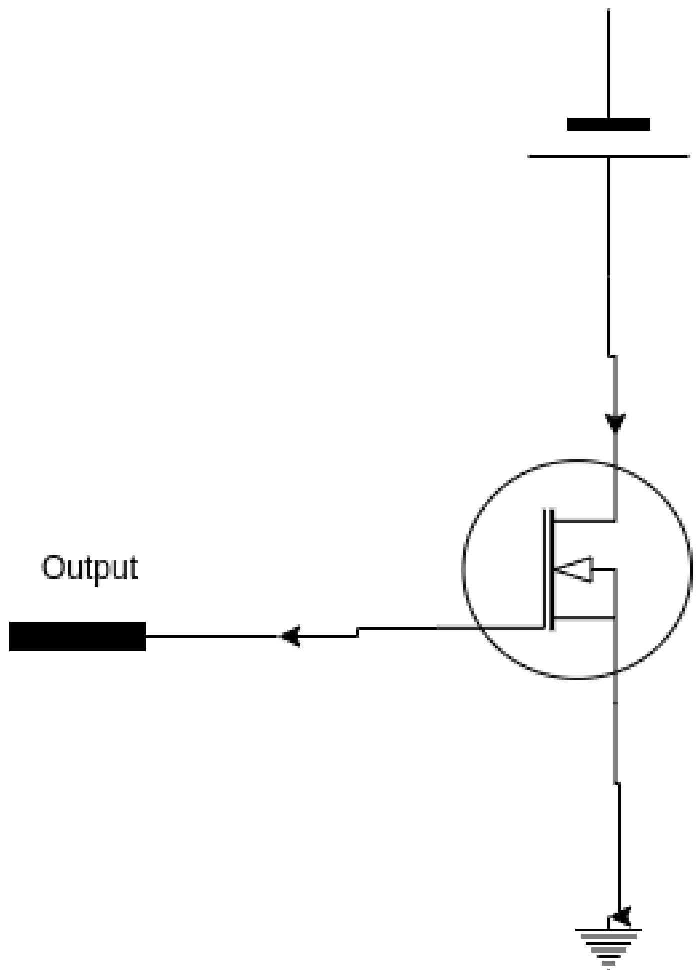

Figure 1.9: A depiction of a MOSFET

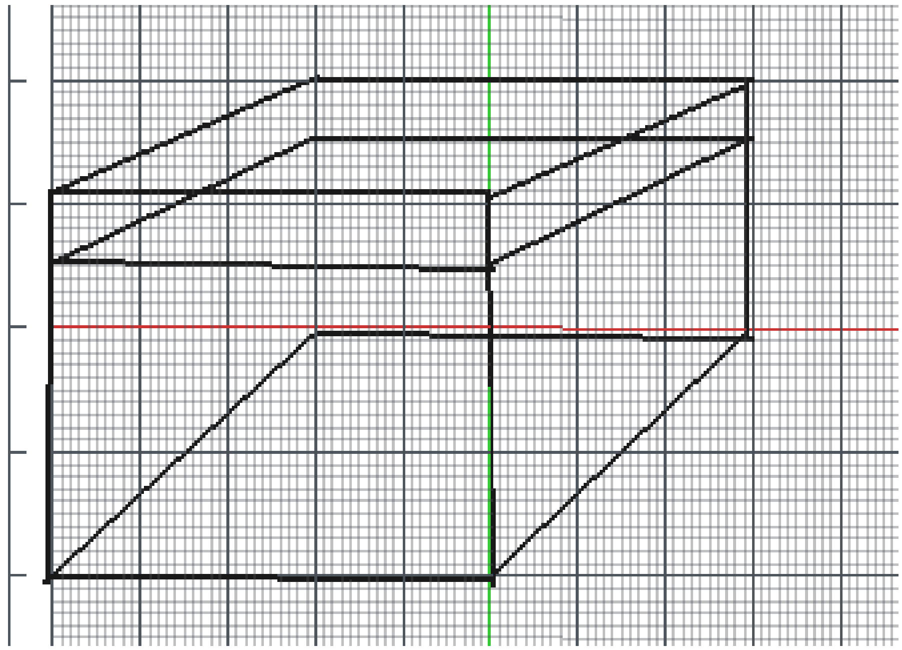

Figure 1.10: A 3D representation of matrices being put one over the other

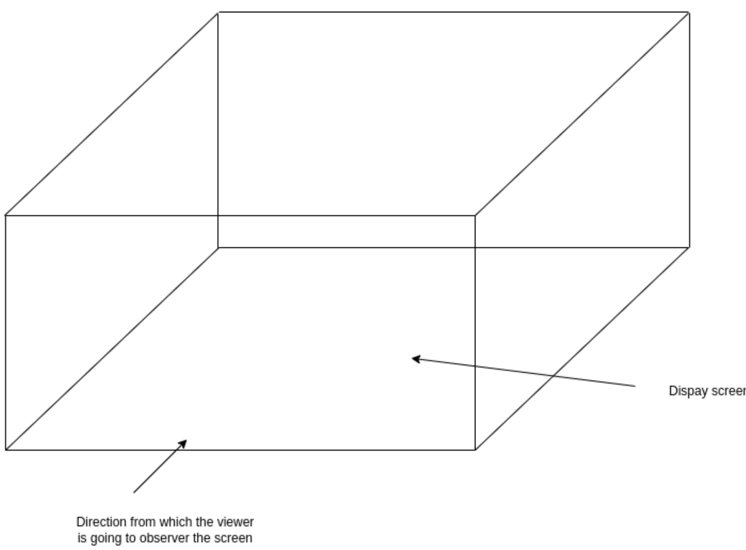

Figure 1.11: A view of the screen and the 3D area

$$S = \frac{D}{T}$$

$$T = \frac{D}{S}$$

$$= \frac{\frac{x^2y^2z^2+2x^2z^2y+2xy^2z^2+4xyz^2+2x^2y^2z+4x^2yz+4xy^2z+8xyz}{8}}{clbt}$$

$$= \frac{(x^2y^2z^2 + 2x^2z^2y + 2xy^2z^2 + 4xyz^2 + 2x^2y^2z + 4x^2yz + 4xy^2z + 8xyz) \times m}{8clbt}$$

Please note that, the above are mechanics to calculate the parameters that can be used to understand what is happenning in the organic layer.

1.4.2 Mechanics that can be used to calculate what happens when electrons collide in the organic liquid layer

Figure 1.8 shows a visualization of the collision.

When the e⁻s collide with each other in the organic liquid layer, they release energy. This energy then gets converted to electricity. The observation was made. One thing I was unsure as to how and why.
Staring with the basic terms as above:

$$V_{Collision} = \frac{E_{Collision} \times F_{Collision}}{n \times 2\pi f}$$

The collision between e^- is inelastic. As such, a part of their body gets shaved off.
To account for that,

$$V_{Collision} = \frac{E_{Collsion} \times F_{Collsion}}{n \times 2\pi f \times (m_1 - m2)}$$

where, f is the frequency of the e^- before collision.
$F_{Collision}$ is the force of collision.

Please note that, 2 x pi x f is to account for the rotation undergone by the e^- prior to collision.
$V_{Collision}$ can be simplified to:

$$V_{Collision} = \frac{E_{Collision} \times m_{e^-} \times a_{e^-}}{n \times 2\pi f \times \Delta m}$$

$$\theta = Cos(\theta + (m_{e^-} \times a_{e^-}))$$

$$I_{\overset{\rightarrow}{Collision}} = (\frac{E_{Collision} \times m_{e^-} \times a_{e^-}}{2\pi f \times \Delta m_{e^-}}, Cos(\theta + m_{e^-} \times a_{e^-}))$$

m_{e^-} is the mass of the e^-.

$\Delta m_{e^-} = (mass\, of\, electron\, before\, collision - mass\, of\, electron\, after\, collision)$

f - Frequency of e^- before collision. $E_{Collision}$ - The electric field emitted during the collision of e^-s.

Force of the collision is cosinusoidal since, the e^- s collide with each other at the base of the collision triangle if you can imagine one.

Chapter 2

Mathematics

2.1 Current Sensing

Something to note before continuing:

- The liquid layer is a chaotic system that has e^{-}s being released from the molecules and the compound and being released into the liquid.
- Since, AMD seems to want to use lasers in the organic layer, we can divide the layer into a three-dimensional tensor and try to get an order of things out of it.

With them cleared, Let us start with the elementary steps.
Let V_{sensed} be a two-dimensional matrix.
where,

$$V_{\text{sensed}} \in |\mathbb{R}|$$

Let it be a matrix the size of the object
Let V_{sensed} for a 10x10 TFT layer be initialized to :

$$V_{sensed} = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

When the e$^-$ touches the TFT at $V_{sensed}[6][5]$, the matrix can become like this

$$V_{sensed} = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0.78 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

As for the mechanics for such a calculation,

For explanation sake, we can take one unit of the TFT as a MOSFET.
Before we go further with this, let us take some terms into understanding and try to come up with ways on how to calculate it.

The source here, is the e$^-$. While, the gate is connected to the current sensors onboard the Silicion to detect variation in current.

As such, you can view each square of the TFT as a tiny MOSFET.

The conception is shown in Figure 1.9.

$$V_{sensed}[i][j] = E \times l \times b \times a$$

where, E is the electric field of the TFT.
l is the length of the TFT cell.
b is the breadth of the TFT cell.
a in this context is the amount of current that the TFT cell can amplify.

Continuing on with the derivation,

$$I = \frac{V}{R}$$

With respect to the TFT,

$$I = \frac{E \times l \times b \times a}{R}$$

We do not have a sensible way of calculating R. So, let us try once again with the basics.

$$R = Resistance\ of\ the\ medium \times area\ of\ the\ medium$$

Let resistance of medium be equal to r. Then,

$$R = r \times area\ of\ the\ medium$$

For the TFT,

$$R = r \times l \times b$$

$$I = \frac{E \times l \times b \times a}{r \times l \times b}$$

$$I = \frac{Ea}{r}$$

The direction in which current flows is a staright line. We can approximate this to a tangential line, Then,

$$I_\theta = Tan\theta$$

Then,

$$\vec{I} = (\frac{E}{r}, Tan\theta)$$

2.2 General purpose computation

Figure 1.10 shows a visualization of the 3D matrix. These can be thought of to be like chess boards on top of chess boards or a 3D matrix with a matrix on top of a matrix.
As such,

$$B = [z][length\ of\ the\ board][width\ of\ the\ board]$$

where, z is the height or the point in height where, the matrix is considered to be there.
On with the derivation

Let A = [x][y][z].

Where, X is the row index of the matrix.
Y is the column index of the matrix.
Z is the matrix number.
Try to think of the matrix like a board. A board where where you can play any game.
With that assumption, let us try something
Like in the previous example, A is a three-dimensional tensor or a 3D matrix.
Then, as a proposal, we can use a string tensor

$$A = \begin{bmatrix} \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} \\ \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} \\ \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} \\ \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} \\ \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} \\ \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} \\ \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} \\ \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} \\ \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} \\ \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} & \text{””} \end{bmatrix}$$

Based on the behaviour, we can say the e^- is exhibiting the behaviour of a chess piece or a game that is analogous to chess.

To model games that are different from chess, we can use a cuboidal tensor and initialize the matrices to something like this:

$$A = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

Instead of a boolean matrix as above, we can use an integer matrix to denote a singular piece.

As for generalization, B can be thought of as a collection of such matrices.

$$B = |\vec{A}|$$

Where, vector of A is a dynamacially allocatable vector, extensible list or an dynamically increasable collection where, the elements can be added on demand.
In other words, vectors used in C++11 onwards.

2.3 Graphics computations

Let D_{region} be the display region.

$$D_{region} = Tensor$$

Let $D_{region} \in Tensor\ space$

2.3.1 Rules

$$Tensor_{row} \in \mathbb{R}$$

$$Tensor_{column} \in \mathbb{R}$$

$$Tensor_{height} \in \mathbb{R}$$

Where, $Tensor_{row}$, $Tensor_{column}$ and $Tensor_{height}$ are the rows, columns and height of the 2D matrix in a tensor.

$$x, y, z \in \mathbb{R}$$

Where, x is the x-coordinate of the e^- in the tensor.
y is the y-coordinate of the e^- in the tensor.
z is the z-coordinate of the e^- in the tensor.
Let e^- be called a particle.
Where, paritcle is an abstraction of the e^-.
x, y, z are the coordinates of the e^- in the tensor.

$$\text{Colour} = \{hue, saturation, brightness\} \in \mathbb{R}$$

where, Colour is the colour shown on the display.
hue is the mixture of colour.
saturation is the saturation of the colour.
brightness is the brightness of the colour.

On a macroscopic scale,

$$D = \{\Delta x, \Delta y, \Delta z\}$$

On a microscopic scale,

$$D = \{dx, dy, dz\}$$

Where, D is the distance travelled by the e^-.

$$Particle \subseteq Object$$

where, Object is a generalized version of a mathematical object.

$$Particle\ movement = \frac{Distance}{Time}$$

On a macroscopic scale,

$$Particle\ movement = \frac{\{\Delta x, \Delta y, \Delta z\}}{T_{elapsed}}$$

On a microscopic scale,

$$Particle\ movement = \frac{\{dx, dy, dz\}}{T_{elapsed}}$$

$$Phasor_n = \{|Phasor_n|, Phasor_\theta\}$$

Where, $Phasor_n$ is a vector in the tensor space rotating around the e⁻.

$$Phasor_\theta = \{Sin\theta, Cos\theta, Tan\theta\}$$

The above trignometry terms are there to caluclate the tilting of the e⁻ in various directions.

$$Properties_{e^-} = \{\{x, y, z\}, \{\Delta x, \Delta y, \Delta z\}, \{dx, dy, dz\}\ \{Sin\theta, Cos\theta, Tan\theta\}, Angular\ velocity, e^- voltage\}$$

$$Angular\ velocity = m_{e^-} v_{e^-} r_{e^-}$$

$$Properties_{e^-} = \{\{x, y, z\}, \{\Delta x, \Delta y, \Delta z\}, \{dx, dy, dz\}\ \{Sin\theta, Cos\theta, Tan\theta\}, m_{e^-} v_{e^-} r_{e^-},\ e^- voltage\}$$

2.3.2 Derivations

Elementary properties first.

$$Particle\ movement = \frac{Distance}{Time}$$

On a macroscopic scale, particles move in standard units.
So, in such a situation,

$$D = D_{macroscopic} = \{\Delta x, \Delta y, \Delta z\}$$

On a microscopic scale, particles move in standard units but on a very microscopic and negligible scale.

$$D = D_{microscopic} = \{dx, dy, dz\}$$

$T_{elapsed}$ is the time the particle took to move from one position to another.
As such,

$$T_{elapsed} = T_1 - T_2$$

Where T_1 is for the sake of explaining, the start time. T_2 is the end time.
Then, for a macroscopic scale,

$$Particle\ movement = \frac{\{\Delta x, \Delta y, \Delta z\}}{T_1 - T_2}$$

On a microscopic scale,

$$Particle\ movement = \frac{\{dx, dy, dz\}}{T_1 - T_2}$$

Do note that, when you divide them, you divide all the variables at a time. As to why Δ,

$$\Delta x = x_1 - x_2$$

$$\Delta y = y_1 - y_2$$

$$\Delta z = z_1 - z_2$$

dx,dy,dz are microscopic versions of $\Delta x, \Delta y, \Delta z$.
For computation purposes,

$$Particle \subseteq Object$$

Where, Object is a generalized mathematical object.
A question one might ask is, "How to measure the particle's movement when it is moving?"
One way you can do it is by making the particle as a vector. In electrical terms, it means : it is a phasor.
To model movement, you might have to take many vectors.

$$Phasor_n = \{|Phasor_n|, \theta\}$$

Where, n is one of the many phasors that can be drawn from the point where the e$^-$ is. To meaure the magnitude of the phasor in this context,

$$|Phasor_n| = e^-\ voltage$$

As for θ,

$$\theta = \{Cos\theta, Sin\theta, Tan\theta\}$$

For x,y and z-axes.
Then,

$$Phasor_n = \{e^- volatge, \{Cos\theta, Sin\theta, Tan\theta\}\}$$

2.4 Machine Learning (ML) and Artificial Intelligence (AI) calculations

2.4.1 Definitions

Let

$$Perceptron\ network = Perceptron\ netowrk[i][j]$$

Where, $Perceptron\ network[i][j]$ is a matrix of dynamically extensible computational vectors.

$$Perceptron\ network[i][j] \in \mathbb{R}$$

$$Markov\ model = \begin{bmatrix} ,, & ,, \\ ,, & ,, \end{bmatrix}$$

for a 2x2 Markov Model. The entries in the matrix are labels.

2.4.2 Derivations

Neural networks are an abstractive way of looking at computations for developing intelligence.
Markov model is an abstracted way of developing wisdom.

Neural networks are a composition of functions. For example, For detecting numbers,

$$f = aliasing\ of\ the\ pixels$$

$$g = sigmoid\ function$$

$$h = activation\ functions$$

$$Perceptron\ network[i][j] = h \circ g \circ f$$

Then,

$$Perceptron\ network[i][j] = activating\ fuctions\left(\frac{1}{1 + e^{-(\frac{p_1+p_2+p_3}{4})}}\right)$$

AI is a transition of states. For example, In the context of the most used AI model known as Goal-Oriented Action Planning (GOAP),
The AI in that game worked thanks to the efforts of the level design team. Making it easy for the AI to find it's way to the player.
The image used in Figure 2.1 is taken from an article on History of Ai in games[**?**].

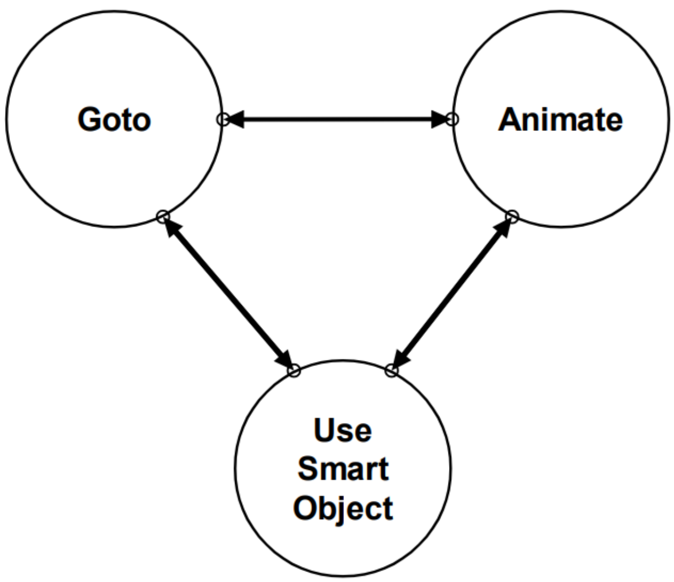

Figure 2.1: An absract view of the AI used in F.E.A.R

Chapter 3

Electrical

3.1 Calculating corrosion of the TFT

Let us start with a few definitions.

- C_{material} is the corrosion constant of the material.
- A_{material} is the area of the material. Optionally, you can calculate volume if you want to.
- V_{material} is the Volume of the material.

Please note that, these definitions are confined to this section only.
Here is the connundrum:

The application of this derivation is to calculate the corrosion that can occur when the liquid oil touches the TFT. The TFT is made using Silicon.
However, there is no data available or observations available at the time of writing on how it affects. By data, I mean numbers. Numbers to support our derivation and the observations that we are presenting. As such, how do we make assumptions or presumptions or axioms about the corrosion that is occuring on the TFT?

Let us begin with some elementary observations, The TFT that is going to be used is a rectangular Silicon.
As such,

$$A_{material} = length \times breadth$$

Corrosion is a cutting down of the area of the object. Then,

$$C_{material} = \frac{l \times b}{(l - reduced\ l) \times (b - reduced\ b)}$$

This can be simplified to,

$$C_{material} = \frac{l \times b}{\Delta l \times \Delta b}$$

$$C_{material} = \frac{lb}{\Delta l \Delta b}$$

For spherical objects,

When you look at the object from the front view, it looks like a circle. From the top view, it looks like a circle.
In 3D, the circle has a height. As such,

For this calculation, let 'h' denote height of the material or the object.

$$A_{material} = \pi \times r^2 \times h$$

$$A_{material} = \pi r^2 h$$

In such a case, $A_{material} = V_{material}$. Otherwise

$$V_{material} = \pi \iint r^2 h \ dr \ dh$$

The double integration is for adding up all the inifinitisemally small parts of the sphere so to get a precise value.

For cylindrical objects,

There are two circles. Each seperated by a height 'h'. As such,

$$A_{material} = 2 \times \pi \times r^2 \times h$$

$$A_{material} = 2\pi r^2 h$$

$$V_{material} = 2\pi \iint r^2 h \ dr \ dh$$

3.2 Normalization of the current

3.2.1 Definitions

- $ADC_{digital\ value}$ is the digitized value of the current recieved from the TFT.
- $DAC_{analog\ value}$ is the analog value of the digitized current.
- R_{e^-} is the reverberation of the e⁻ in the context of this section.
- f_{e^-} is the frequency of the e^- in the context of this section.

3.2.2 Fourier Transform (FT) in the domain of organic liquid

$$f(x) = expression\ of\ the\ wave$$

$$FT = \frac{d(f(x))}{dx}$$

Please note that, FT means Fourier Transform.
For $f(x) = Sin(\omega t + \theta)$

$$FT = \frac{d(Sin(\omega t + \theta))}{dt}$$

For computation purposes, Applying Newton-Rhapson method,

$$Newton - Rhapson(FT) = Newton - Rhapson(\frac{d(Sin(\omega t + \theta))}{dt})$$

$$= Newton - Rhapson(d(Sin(\omega t + \theta))) + Newton - Rhapson(dt)$$

Newton-Rhapson method is a way of approximating the equations to an infinitisemally small value. When applied to differentiation operators, it makes them become associative. For example,

$$Newton - Rhapson(\frac{d(f(x))}{dx}) = d(f(x)) + dx$$

Since, approximating d(f(x)) and dx makes them a single value. As it is defining limits very close to the expression.
Continuing on with the derivation,

$$Newton - Rhapson(FT) = Sin(d(\omega t) + d(\theta)) + 1$$

Approximating dt to infinitisemally small value gives 1. Since, dt itself is an infinitesmally small value, making it even more infinitisemally small value, gives 1 or 0. Depending on which one you choose as the variable becomes a constant If a need arises where you need to calculate that,

$$lim_{t \to 0} dt = more\ infinitisemally\ small\ value$$

With that,

$$Newton - Rhapson(FT) = Sin(d(\omega t) + d(\theta)) + 1$$

$$= Sin(\omega \times 1 + 1) + 1$$

$$= Sin(\omega + 1) + 1$$

Fourier Transform of a wave of Sinusoidal, Cosinusoidal and Tangent forms have a range of (-1,1)

$$FT \in (-1, 1)$$

$$Newton - Rhapson(FT) = Sin(\omega + 1) + 1$$

Then,

$$FT \in (0, 2)$$

FFT is a faster way of computing FT. Fourier Transform is not a means of switching domain so much so as getting discrete values. For domain change, A function change is enough. If,

$$f(x) = g(y)$$

On domain change,

$$f(x) = h(y)$$

On function change,

$$g(x) = l(y)$$

Taking an example,

$$f(x) = x + 1$$

$$f(x) = y$$

$$y = f(x) = x + 1$$

The co-domain of the function is going to be the same no matter what you do Since, co-domain is the domain of all possible results.
On function change,

$$y = j(x) = x^2 + 1$$

The co-domain changes.
Back to the derivation.

$$FT \in (0, 2)$$

FFT is an electronics implementation. There are no equations for it. On a macroscopic scale,

$$FT = Sin(\omega_1 t + t_1) * Sin(-\omega_2 t + t_2)$$

$$= Sin((\omega_1 - \omega_2) + (t_1 + t_2))$$

$$= Sin(\Delta\omega + \delta t)$$

To keep only ω,

$$FT = Sin(\omega_1 + t_1) * Sin(-\omega_2 - t_1)$$

$$FT = Sin((\omega_1 - \omega_2) + (t_1 - t_1))$$

$$FT = Sin(\omega_1 - \omega_2 + 0)$$

$$FT = Sin(\omega_1 - \omega_2)$$

$$= Sin(\Delta\omega)$$

On a microscopic scale,

$$FT = \int_{t1}^{t2} Sin(\omega t + \theta) dt$$

Back to the derivation,

$$Newton - Rhapson(FT) \in (0, 2)$$

Then,

$$(Sin(\omega + 1) + 1) \in (0, 2)$$

3.2.3 Reverberation and wave correction

3.2.4 Finiding digital value of an electric wave

Chapter 4

Electronics

An analogy to a transistor in this implementation is the CH_4 molecule. It radiates two e^{-}. You can use that to make a simple transistor. Using that, you can make logic gates.

4.1 Boolean space in an organic space

$$A \cap B = \textit{an operation in the commutative space}$$
$$A \cup B = \textit{an operation in the abelian space}$$

A^{-} or a twos complement is a rotation of the e^{-} in the whole number space.

$$A \cup (A \cap B) = A \cup A \cap B \cup A$$
$$= A \cap (B \cup A)$$
$$A \cup (A \cap B) = A$$

The above equation translates to:

$$A + (B \oplus A)$$

where, $\oplus$ means commutative operation.
$+$ means abelian operation.

4.2 Logic Gate abstraction

4.2.1 NOT gate

NOT(A) = A - A. This translates to A exclusion of A.
NOT(-A) = A. This translates to A inclusion of A.

4.2.2 AND gate

A AND B = $A\ X\ B$. A abelian of B.

4.2.3 OR gate

A OR B = $A \oplus B$. A commutative of B.

4.2.4 XOR gate

A XOR B = $A \cup (A - B)$.

Chapter 5

Chemistry

5.1 Equations for the compound

Some elementary axioms:

- Try to imagine the molecules as balloons. Balloons where e⁻s are the air in the balloon. When e⁻s are exchanged, the air in the balloon decrease. When they are accepted, air in the balloon increases.
- The molecules in an abstract fashion represent a set. In a way, they can be used to represent a group. The elements or e⁻s in the set are commutative by themselves. As such, they follow commutative algebra of groups.

5.2 Derviations and Calculations

Let $A \in \mathbb{R}$.

$$A \in \{\mathbb{R} : \mathbb{R} \in e^{-}\}$$

where, e^- means electrons.
e^-s are commumative by themeselves.
With that observation, let us begin.

$$e^{-} \in moleule\ space$$

$$Molecule\ space \subseteq Molecules$$

where, Molecules is the super set of all chemical molecules.

$$Molecules \subseteq Chemicals$$

$$Chemicals \subseteq Chemistry$$

Using that logic,

$$A \in \{R : R \in Chemistry\}$$

Pushing forward,
e$^-$s have charge and emitting radiation in the form of β radiation.
To calculate that,
Let E_{e^-} denote the energy released by an e$^-$. Then,

$$E_{e^-} = E \times O_{e^-}$$

Where, O_{e^-} is the molecular orbit of the e$^-$.

$$I_{e^-} = \frac{E \times O_{e^-} \times radius\ of\ the\ e^-}{R}$$

Do note that, in chapter 2 we said that R in the context of this SoC is the viscosity of the medium. We can generalize this to mean fluid drag of the oil.
With that in mind,

$$R = R_{oil}$$

Where, R_{oil} is the viscosity of the oil or it's greasiness.
Some definitions:

- A_{oil} is the area occupied by the oil.
- V_{oil} is the volume occupied by the oil.

In a two-dimensional object,

$$A_{oil} = length\ of\ the\ oil\ spread \times breadth\ of\ the\ oil\ spread$$

$$A_{oil} = l \times b$$

$$A_{oil} = lb$$

Do note that, length of the oil spread is calculated in two dimensions and breadth of the oil spread is also calculated in two dimensions.
The oil in this type of environment, is taken to spread on the material.

$$V_{oil} = l \times b \times thickness\ of\ the\ oil$$

We can generalize this thickness to h in this situation.

$$V_{oil} = l \times b \times h$$

$$V_{oil} = lbh$$

The above equations are for calculating it in on a macroscopic scale.
However, do note that in 3D, we can measure this spread by generalizing it to

a curve by drawing out the edges of the spill.

$$f(x) = equation\ of\ the\ curve$$

By using calculus,

$$A_{oil} = \iint f(x) = \iint equation\ of\ the\ curve$$

$$V_{oil} = \iiint f(x) == \iiint equation\ of\ the\ curve$$

The above equations are for calculating them on a microscopic scale. Now that these are cleared,

5.3 Current

If you want to calculate them on a macroscopic scale,

$$I_{e^-} = \frac{E \times O_{e^-} \times radius\ of\ the\ e^-}{R}$$

$$I_{e^-} = \frac{E \times O_{e^-} \times r_{e^-}}{R}$$

Using area,

$$I_{e^-} = \frac{E \times O_{e^-} \times r_{e^-}}{lb}$$

Using volume,

$$I_{e^-} = \frac{E \times O_{e^-} \times r_{e^-}}{lbh}$$

$$I_{e^-} = \frac{EO_{e^-} r_{e^-}}{lbh}$$

On a microscopic scale, Using area,

$$I_{e^-} = \frac{EO_{e^-} r_{e^-}}{\iint f(x)}$$

$$I_{e^-} = \frac{EO_{e^-} r_{e^-}}{\iiint f(x)}$$

5.3.1 Voltage

On a macroscopic scale, Using area,

$$V_{e^-} = EO_{e^-} r_{e^-} \times lb$$

Using volume,

$$V_{e^-} = E \times O_{e^-} \times r_{e^-} \times lbh$$

$$I_{e^-} = EO_{e^-}r_{e^-} \times lbh$$

On a microscopic scale, Using area,

$$V_{e^-} = EO_{e^-}r_{e^-} \times \iint f(x)$$

Using volume,

$$V_{e^-} = EO_{e^-}r_{e^-} \times \iiint f(x)$$

Now that the basics are done,

5.4 About the commutative group

Using the abstractions in 5.1 and 5.2,

$$A \in G, \{G \in \mathbb{R} : \mathbb{R} \in W\}$$

Where,
R in this context is the set of e^-s emitted by the molecules.
W is the superset of whole numbers.
Electrons when emitted tend to merge with other e^-s and create leptons. With that in mind, we can say that the analogus baloon used to explain the transfer of e^- can be thought of to be a group now. Then,

$$A\ is\ a\ group\ with\ respect\ to\ commutative\ algebra$$

$$A \in G \in \mathbb{R} \in W$$

$$A \in W$$

Chapter 6

Notes

- Figure 1.3 is the proposed SoC stack. It is layered vertically. The Silicon TFT is going to be provided by Broadwell. Silicon by TSMC (Taiwan Semiconductor Manufacturing Company) as was disscussed in the meeting.
- Figure 1.4 is the proposed SoC layout that is to be imprinted on the polymerized oil. Computers here means things that calculate. The middle one is for general purpose calculations.
- LaTeXrendered the last two figures out of place. I tried rendering the 1st one in the supposed place. It did not happen. I gave up on the second one.
- Please note that sesame seeds are not the only way you can use to do computations. They were chosen because they gave the highest performance.
- Drawio was not able to accomdate for fractional scaling as such few of those bonds are in a slanting position.
- I don't know what electronics AMD is using to process signals from the TFT as such I did not include any electronic diagrams in the document.
- The technology was given to AMD and is patented by them.
- The MOSFET diagram seems insulting enough. Might be good as a revision.
- Graphics for this is something that has not come up before. As such, I am not sure about this and I pass it onto the graphics group.
- I am not sure about the data that I can expect from the user. I don't have any idea on the compilers required for such a task. As such, I am leaving it to the heterogenous computing group.

Chapter 7

Addendum