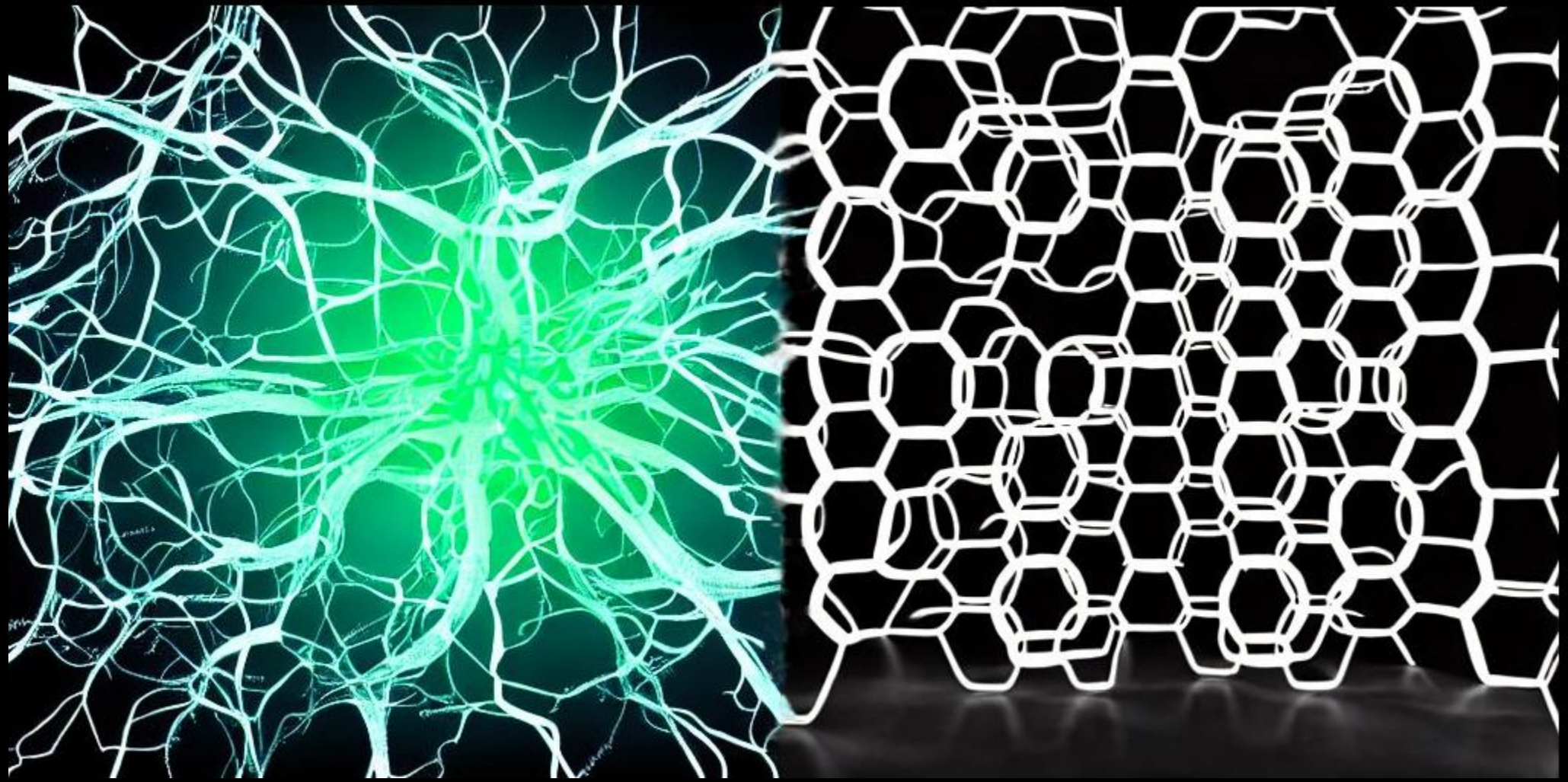
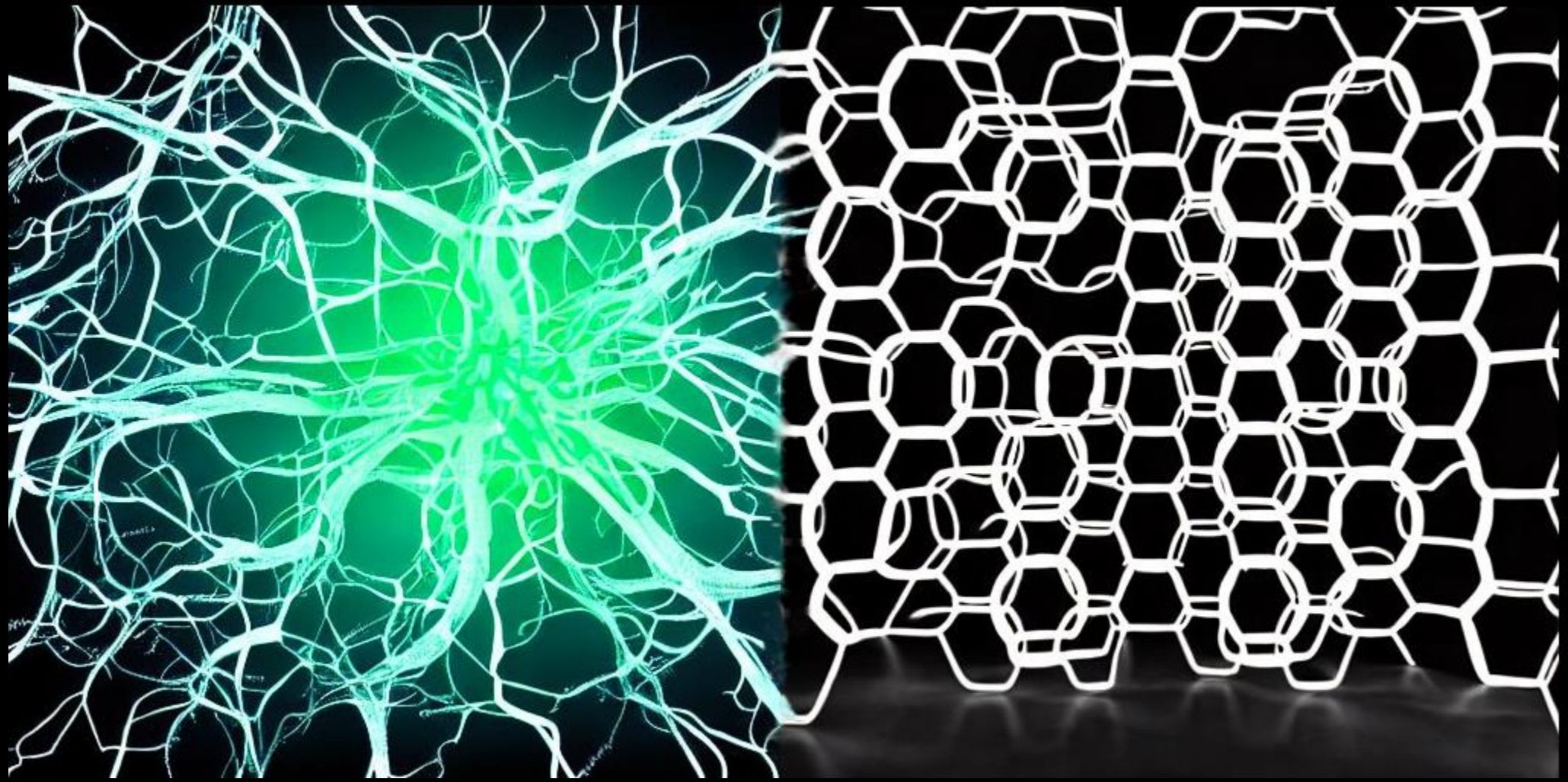
Plovdiv Game Jam 2023



NEURONS & WEEDS



NEURONS & WEEDS

BY

TOSH & CHRONICIDLE

TEAM *"NEURONS AND WEEDS"*

TOSH - TODOR ARNAUDOV

- “Universal man” („Jack of All Trades“)
- Researcher & Entrepreneur in Artificial General Intelligence (Author of the World’s first University Course in AGI – Plovdiv, 2010, 2011)

Chronicidle

Georgi Dimov

- ....
- ...
- ...
- ...

NEURONS & WEEDS

GENRES

BOARD GAME, ABSTRACT,
SIMULATION, LOGIC, MATHEMATICS,
BIOLOGY, NEUROSCIENCE
EDUCATIONAL (HIGHER)

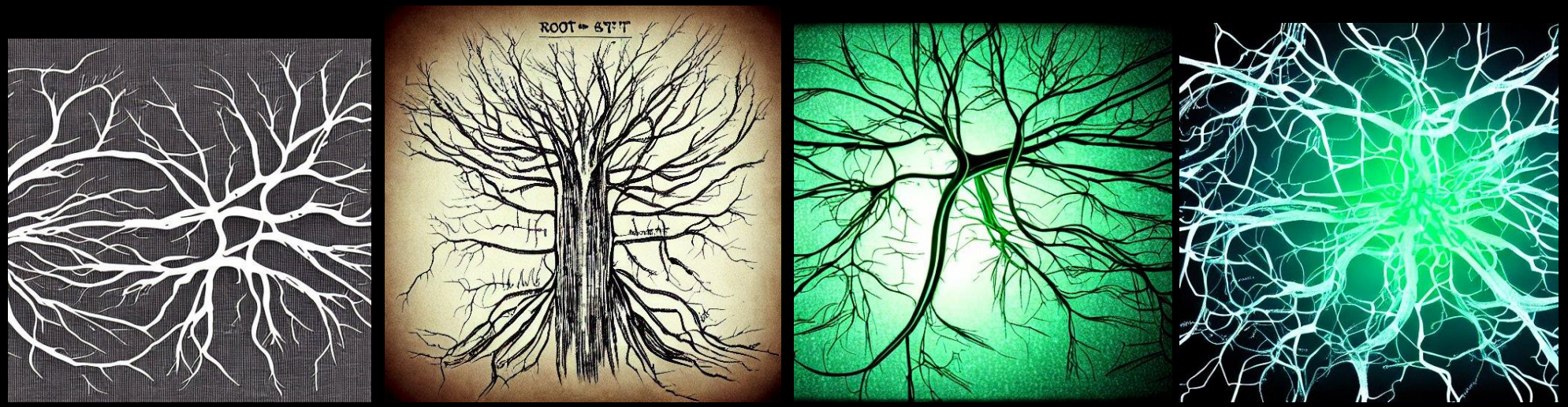
FUTURE: TURN-BASED AND RT STRATEGY

CREDITS

GAME DESIGN	NEURONS – TOSH WEEDS - CHRONICIDLE
SLIDES DESIGN	TOSH
LOGO IMAGES	STABLE DIFFUSION GIMP IRFANVIEW

https://github.com/Twenkid/PlovdivGameJam2023-Neurons-And-Weeds

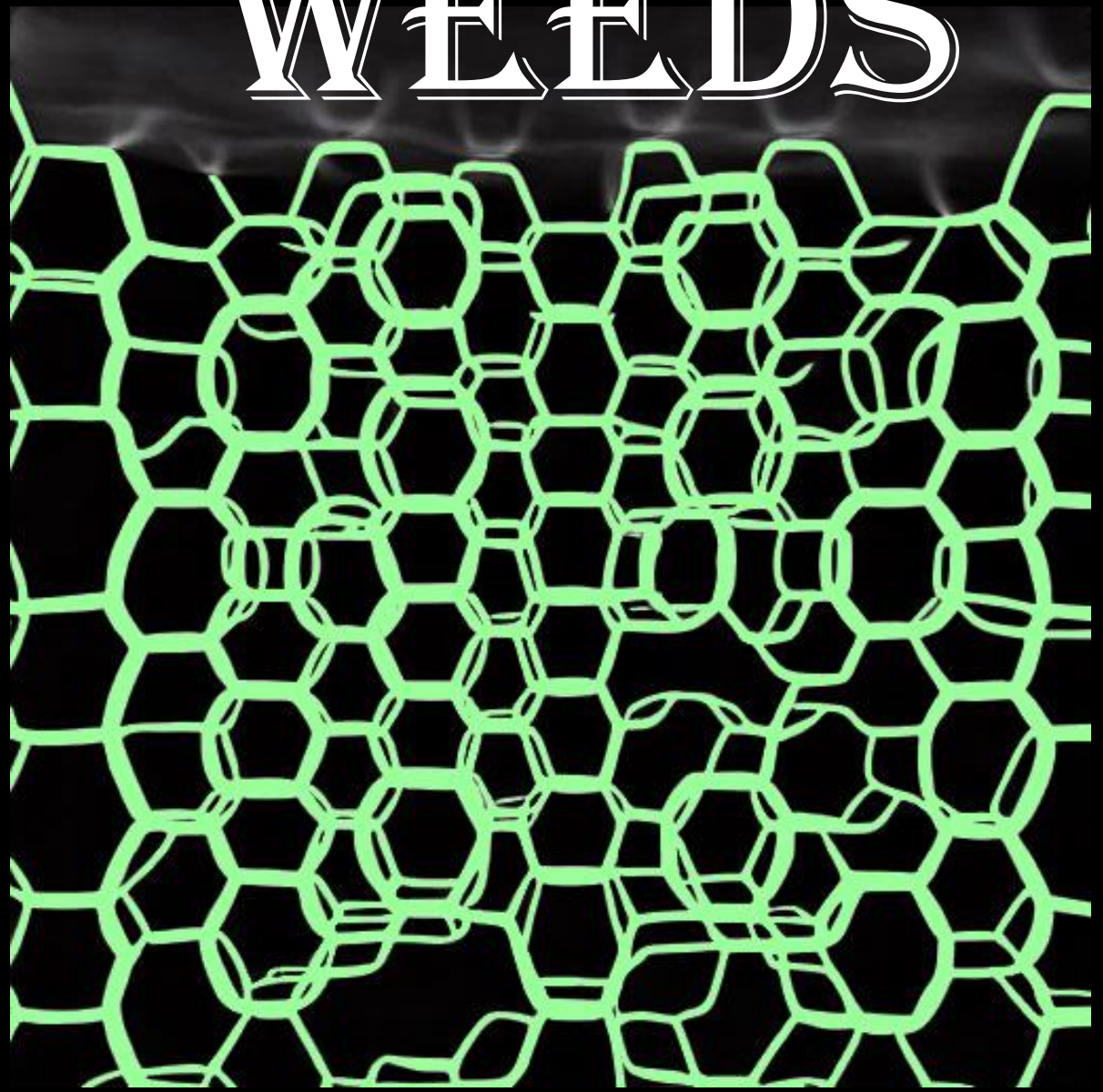
Roots?



living, growing, branching, connecting
charging-feeding, visual similarity, ...

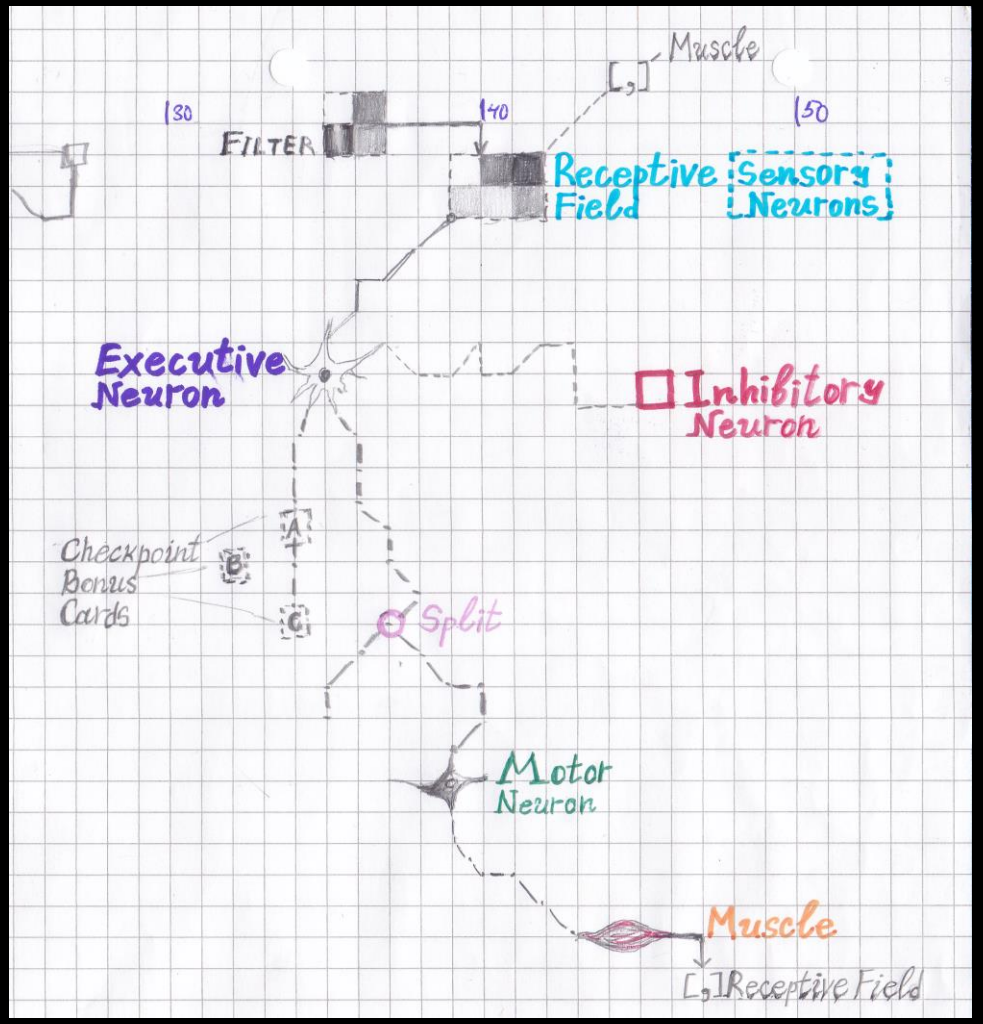
https://github.com/Twenkid/PlovdivGameJam2023-Neurons-And-Weeds

WEEDS

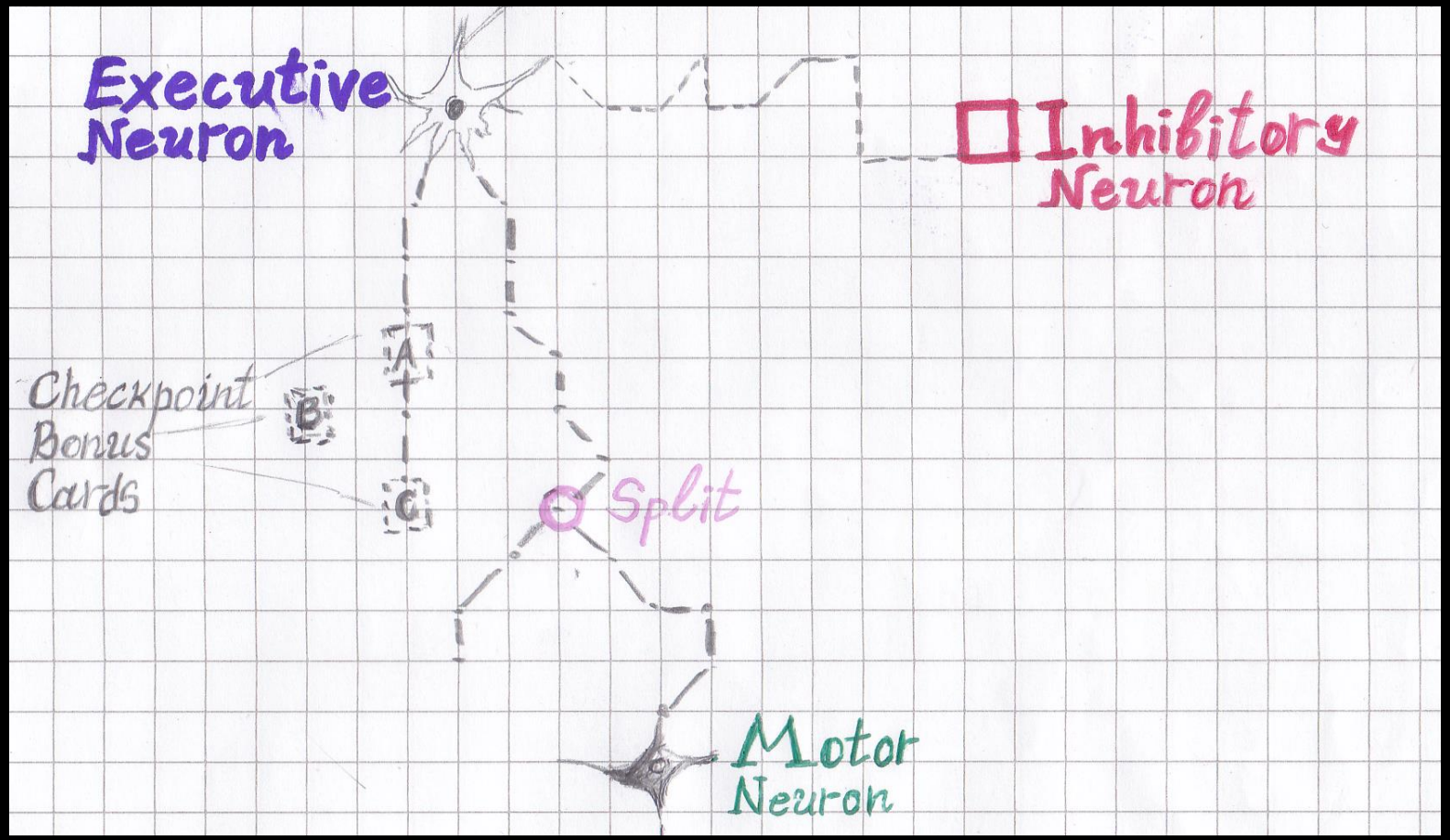


WEEDS

NEURONS


Muscle
30
40
50
FILTER
Receptive Field
Sensory Neurons
Executive Neuron
Inhibitory Neuron
Checkpoint Bonus Cards
A
B
C
Split
Motor Neuron
Muscle
Receptive Field

NEURONS


Executive Neuron
Inhibitory Neuron
Checkpoint
Bonus
Cards
A
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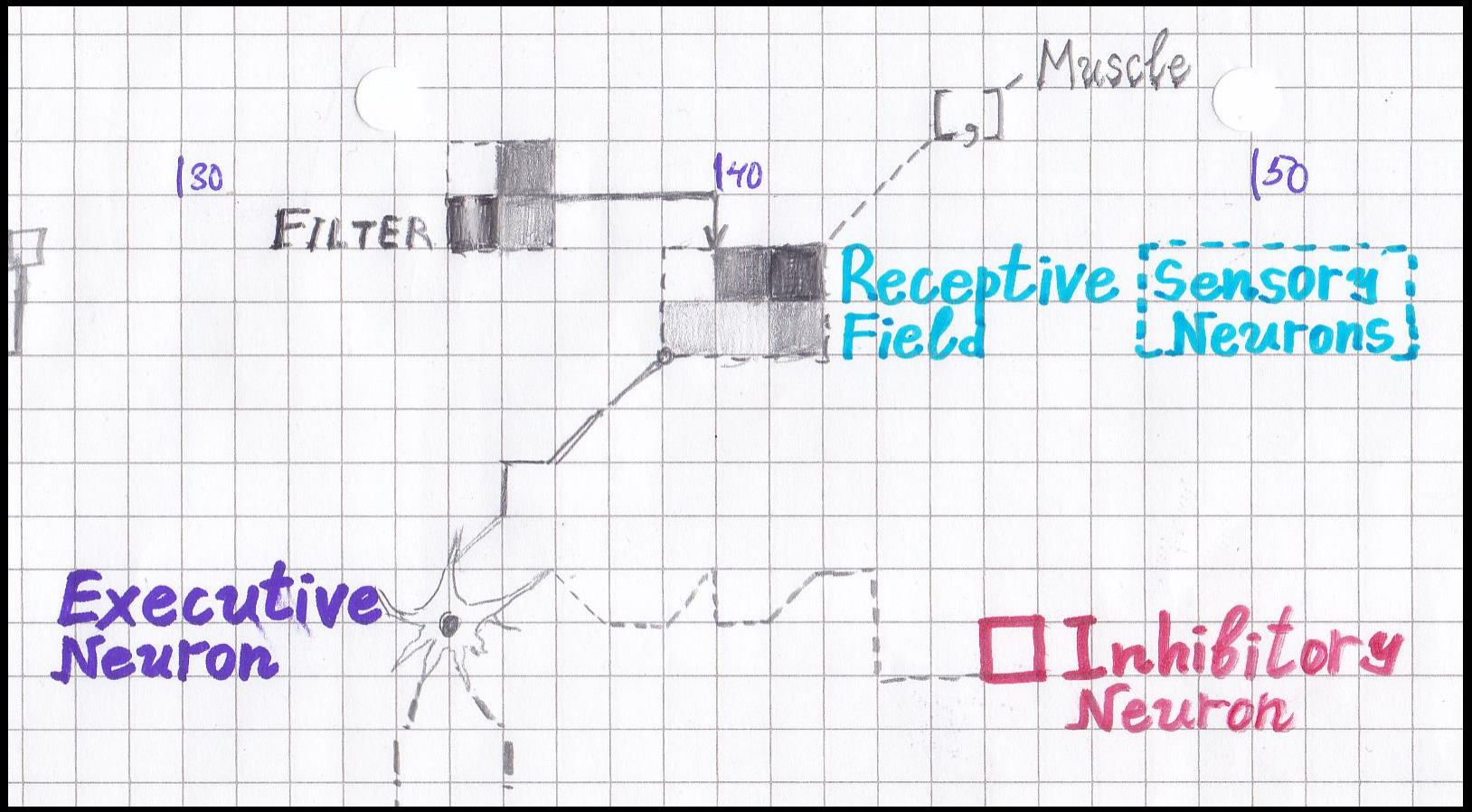
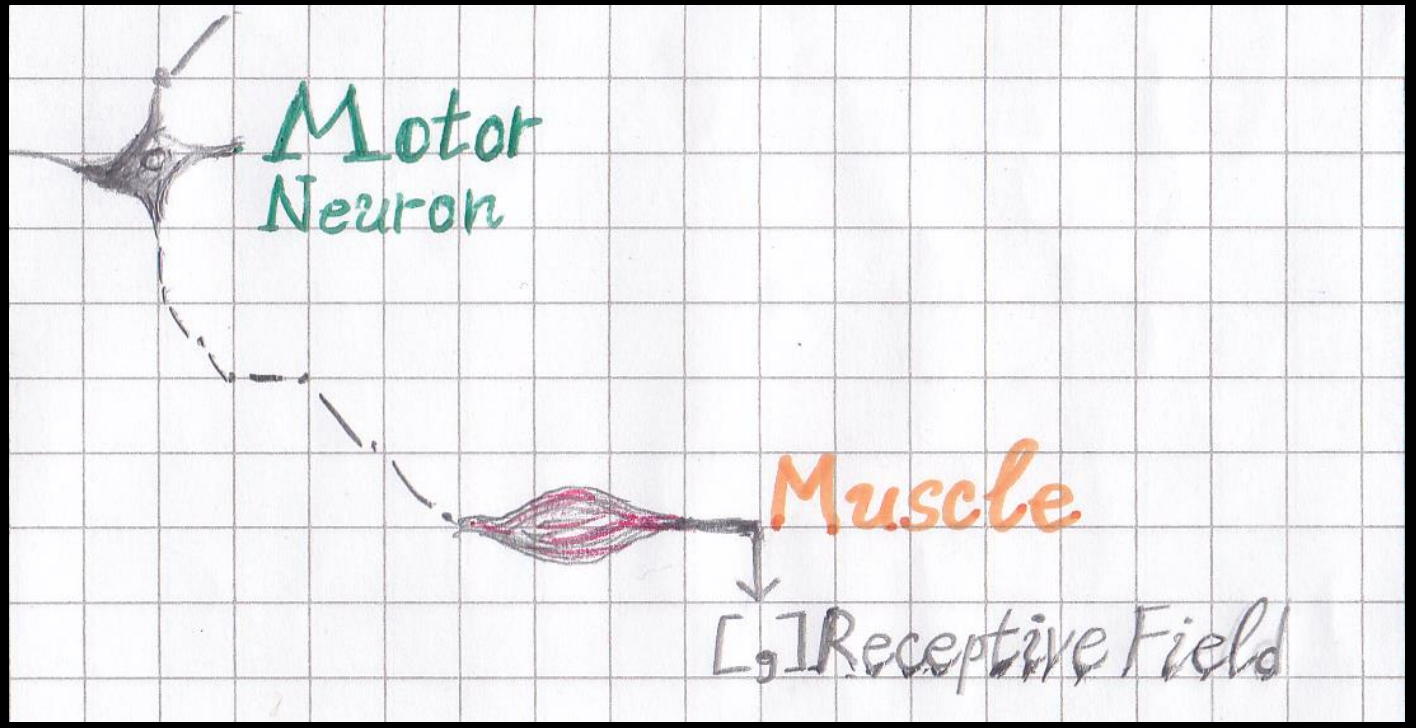
Motor Neuron

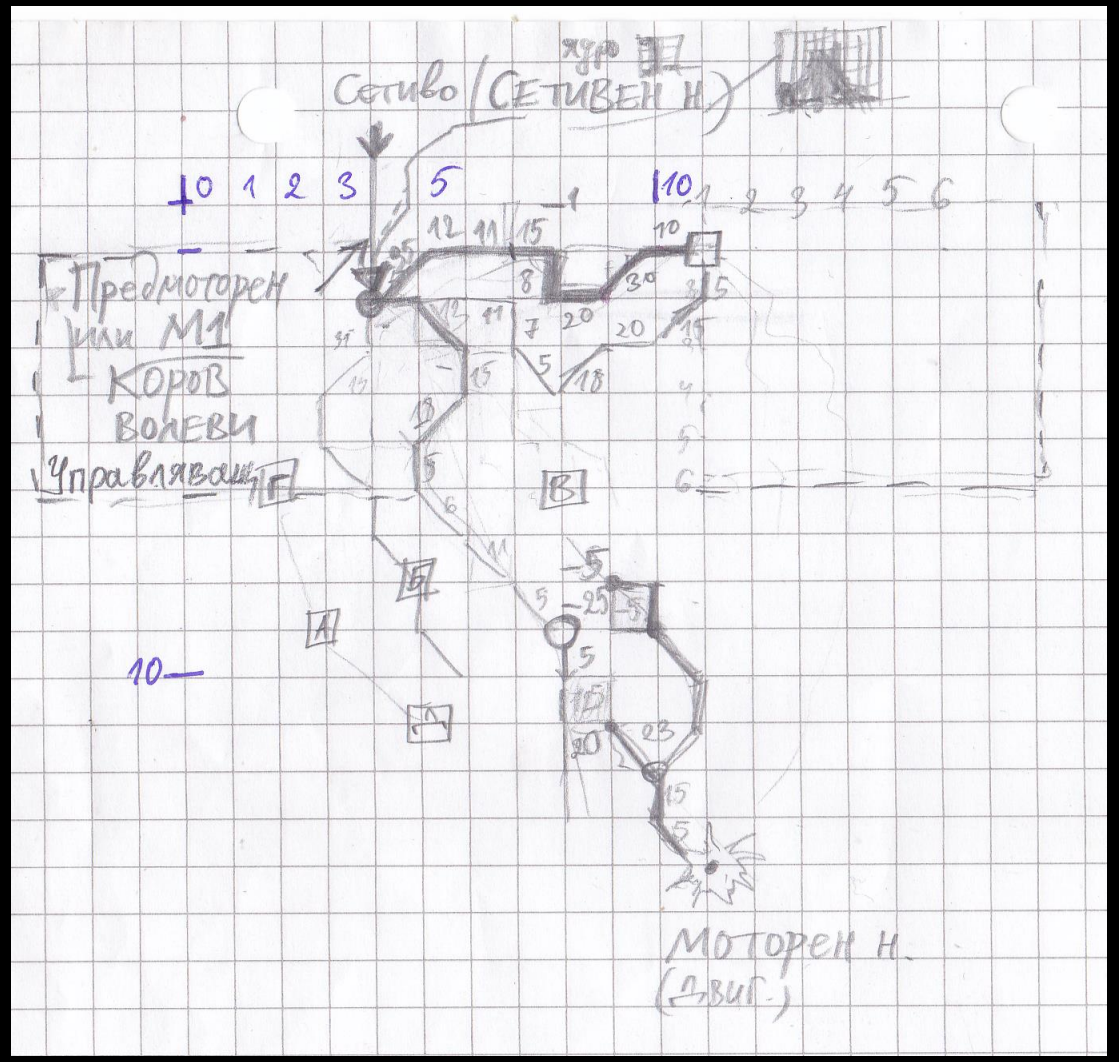
NEURONS


Muscle
130
140
150
FILTER
Receptive Field
Sensory Neurons
Executive Neuron
Inhibitory Neuron

NEURONS



NEURONS


Сетиво (СЕТИВЕН н.)
Предмоторен или М1 КОРОВ ВОЛЕВИ
Управляващ
Моторен н. (Двиг.)

NEURONS

- **Neurons – Executive, Motor, Sensory and Inhibitory**
- **Resources –** Energy (**Charge**) & Building Material (**Proteins and Fat**)
- **Three levels** of energy sources:
  cell, glia and blood
  e.g. 1000, 5000, 100000 …
  (higher level – more energy, but more lag:
  slower to charge the neuron)

NEURONS

- **Goals:** Executive neurons should connect with the Motor and the Sensory neurons and Maximize their own charge.
  Inhibitory neurons should connect to the Executive (opposing players) and reduce their charge.
  Possible ending conditions are: 0 charge for the executive neuron (losing players), or some threshold maximum values for the winner(s)

NEURONS

- **Inhibitory neurons** are driven by the **other player(s)**. They target the **Executive neuron**, and when connected: **Reduce** target's charge
- Each operation **cost energy and materials**
- The player **can create new neurons** (all types)
- The player can **grow** axons from each neurons
- The player can **"apoptose" (self-destruct) a neuron or a connection and recycle part of the resources**

NEURONS

- Once neurons are connected, the **strength** of the connections (the path weight) is reduced by a coefficient on each next cycle (e.g. *0.9, *0.9, *0.8, …) so the player is motivated to grow new connections
- There are splits, which allow to branch connections and create a bigger **flow** and a higher charge, but the split costs resources
- The enemies can put **barriers** which reduce the charge on the path to the motor and sensory neurons

NEURONS

When the neurons are **connected**, on each **cycle** the **executive neuron is charged:**

- to **Motor** neurons - with the Sum of the weights from the path (could be many branches)
- **Sensory neurons** – depending on the **filter (template), compared** to the **receptive field (image)**

When the executive→sensory & executive→motor & motor→muscle, on each cycle the player can **move the filter (change the coordinate) in order to maximize match == charge!**

NEURONS

- The growing of axons and their **strength (weight)** is piece-wise **semi-random**: partially decided by a dice etc., partially by a base value (possibly dynamic)
- The player can **alter** some of the outcomes and can select whether he chooses his actions **before** or **after the random result**, but that costs charge and material.
- There are special cards for overriding some values, doubling, reducing etc., **reflecting the inhibitory signal** (reducing the other player's neuron's charge)

NEURONS

The rules are complex...

- Please, refer to Github for the complete rules, details and a future computer game based on this design:
  * turn-based
  * real time strategy

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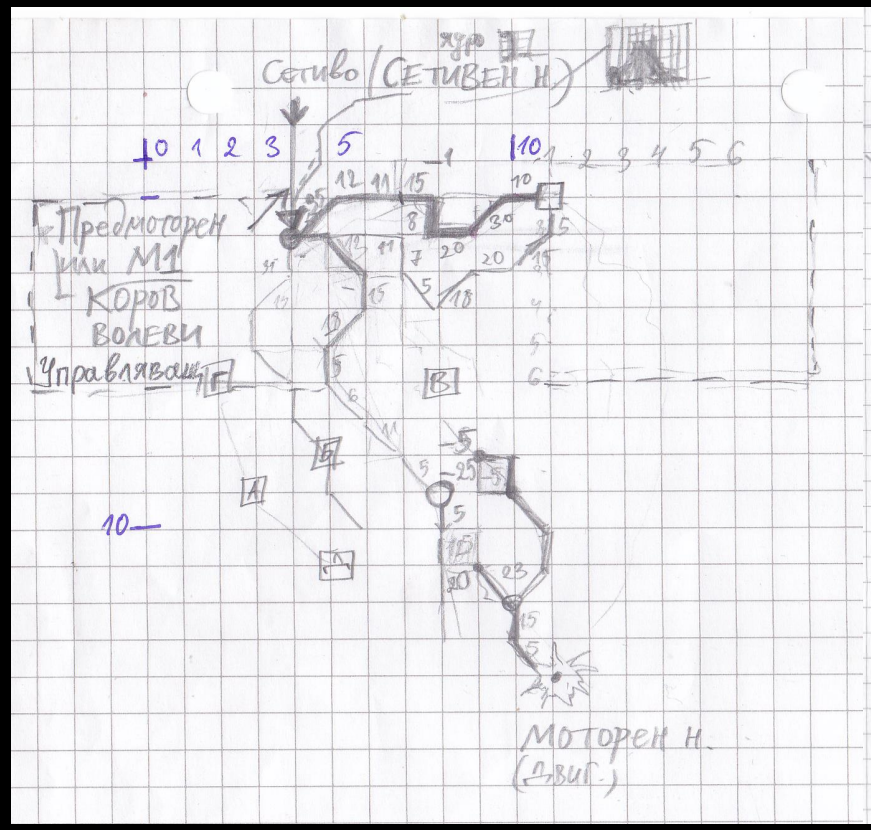
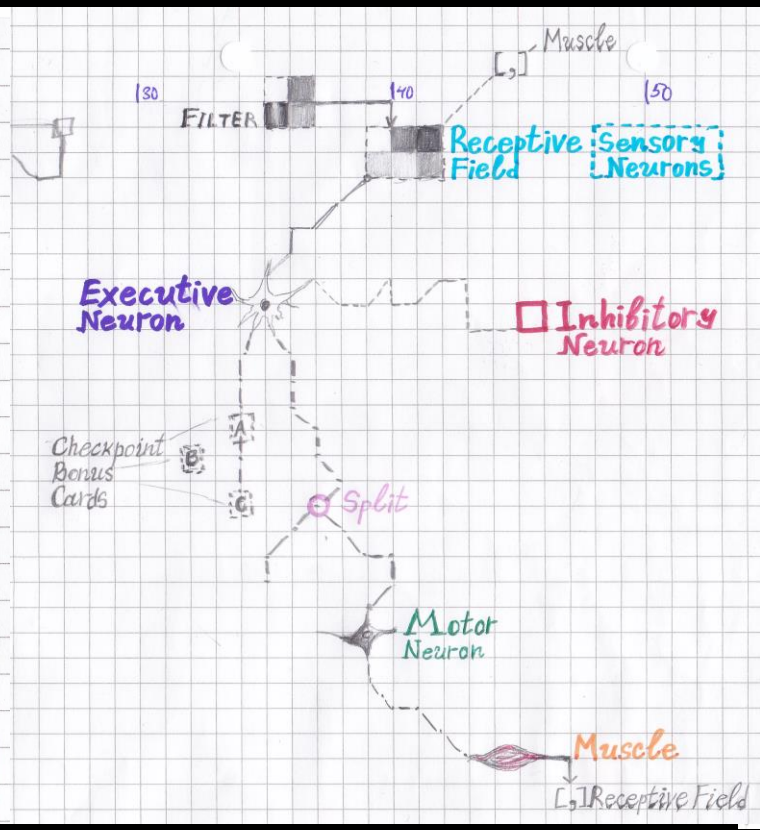
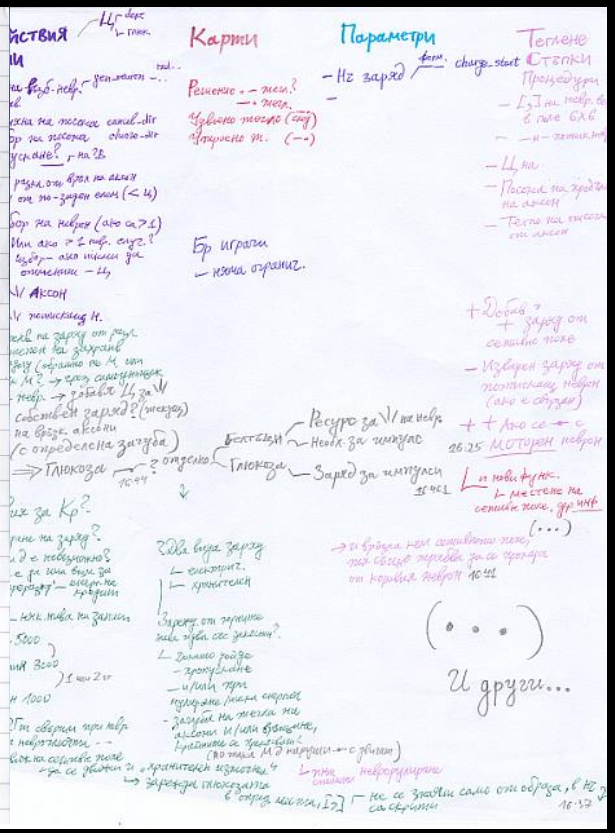
NEURONS







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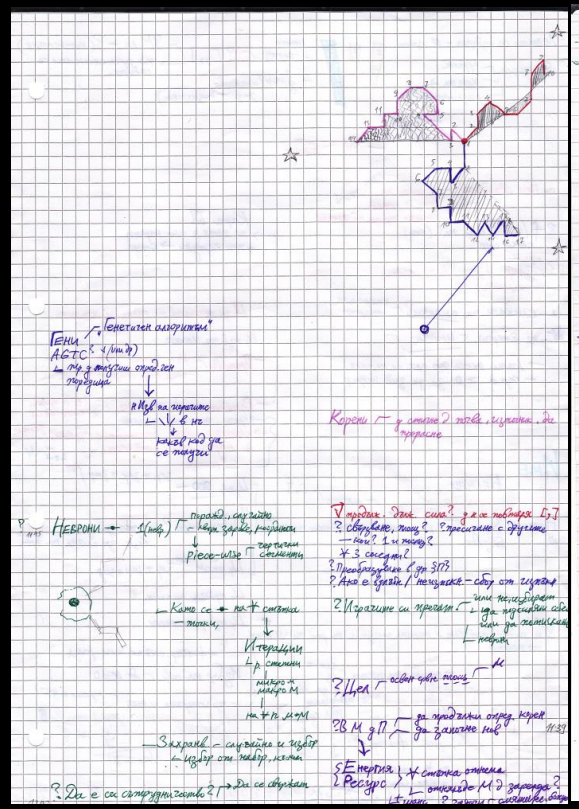
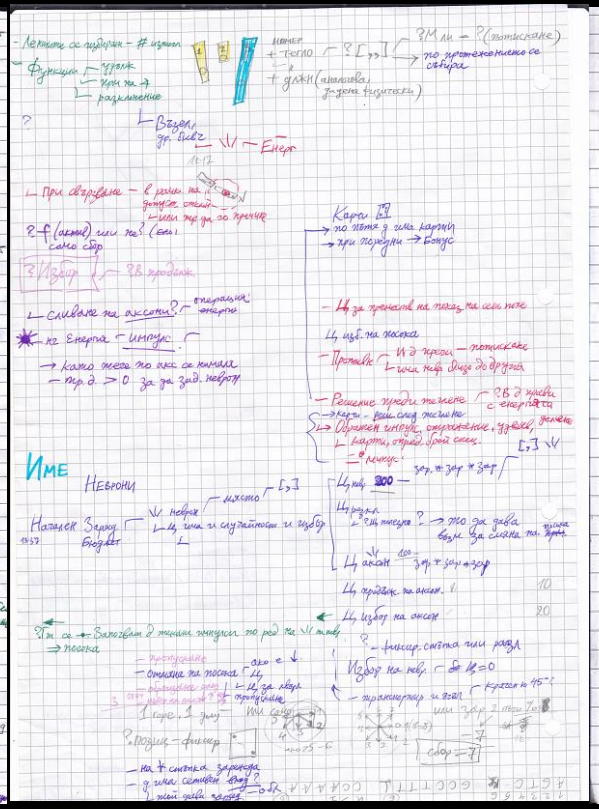
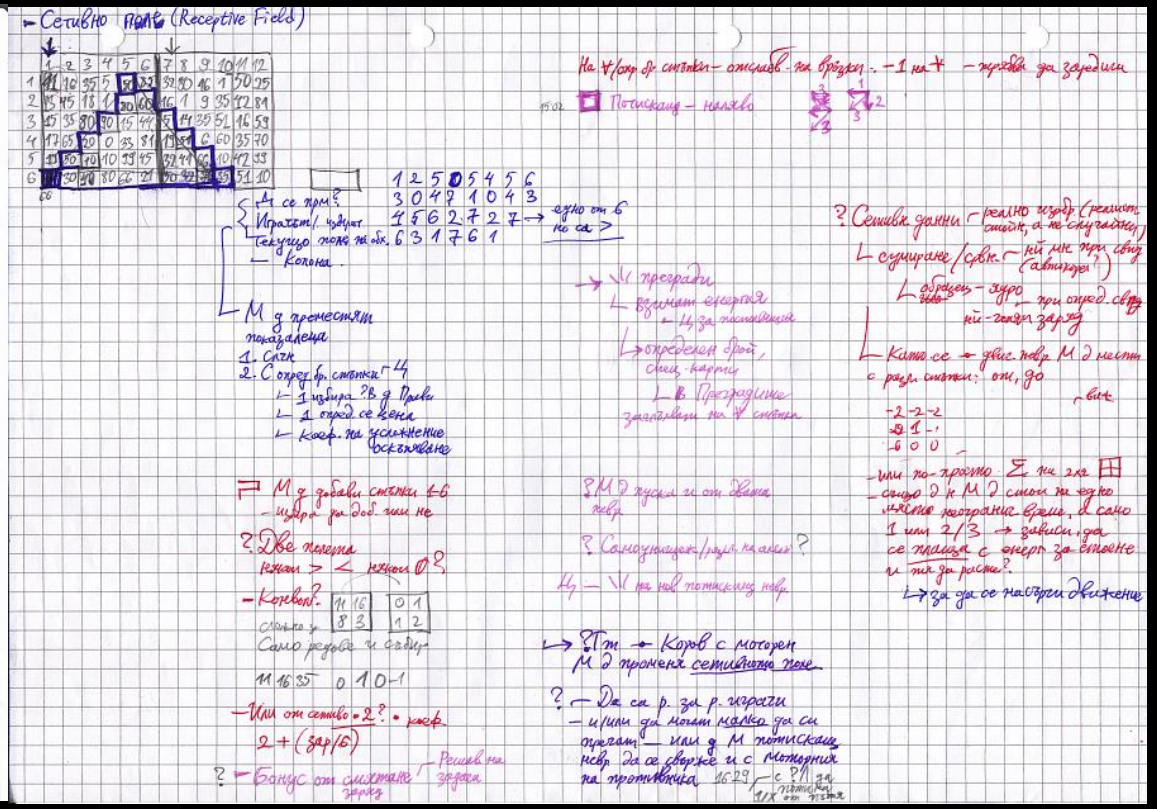
NEURONS







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