



Ultra-low power AI technologies for 6G

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Enabling communication
through innovations
since 1876

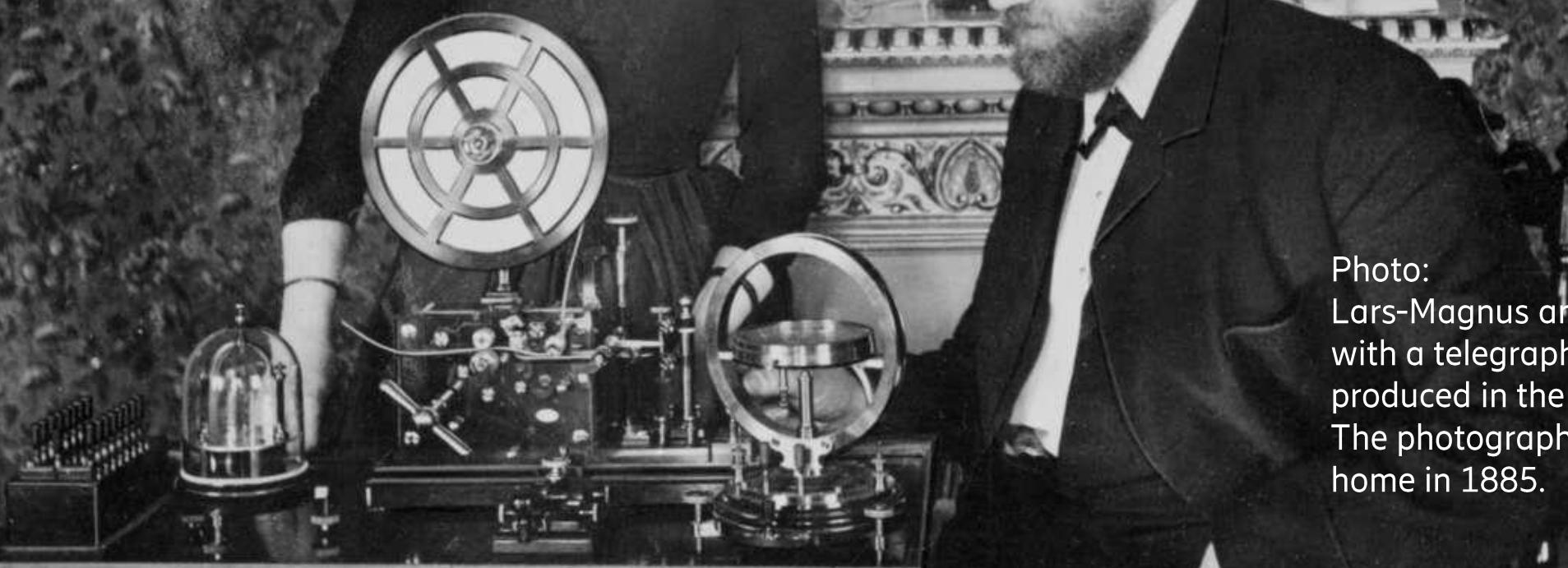


Photo:
Lars-Magnus and Hilda Ericsson
with a telegraph and instruments
produced in the workshop.
The photograph was taken in their
home in 1885.

We are a world leader in mobile networks

Leading position in 5G



Industry analysts:

Ericsson
5G Leader

Ericsson presence:

166 live 5G
networks

Ericsson customers:

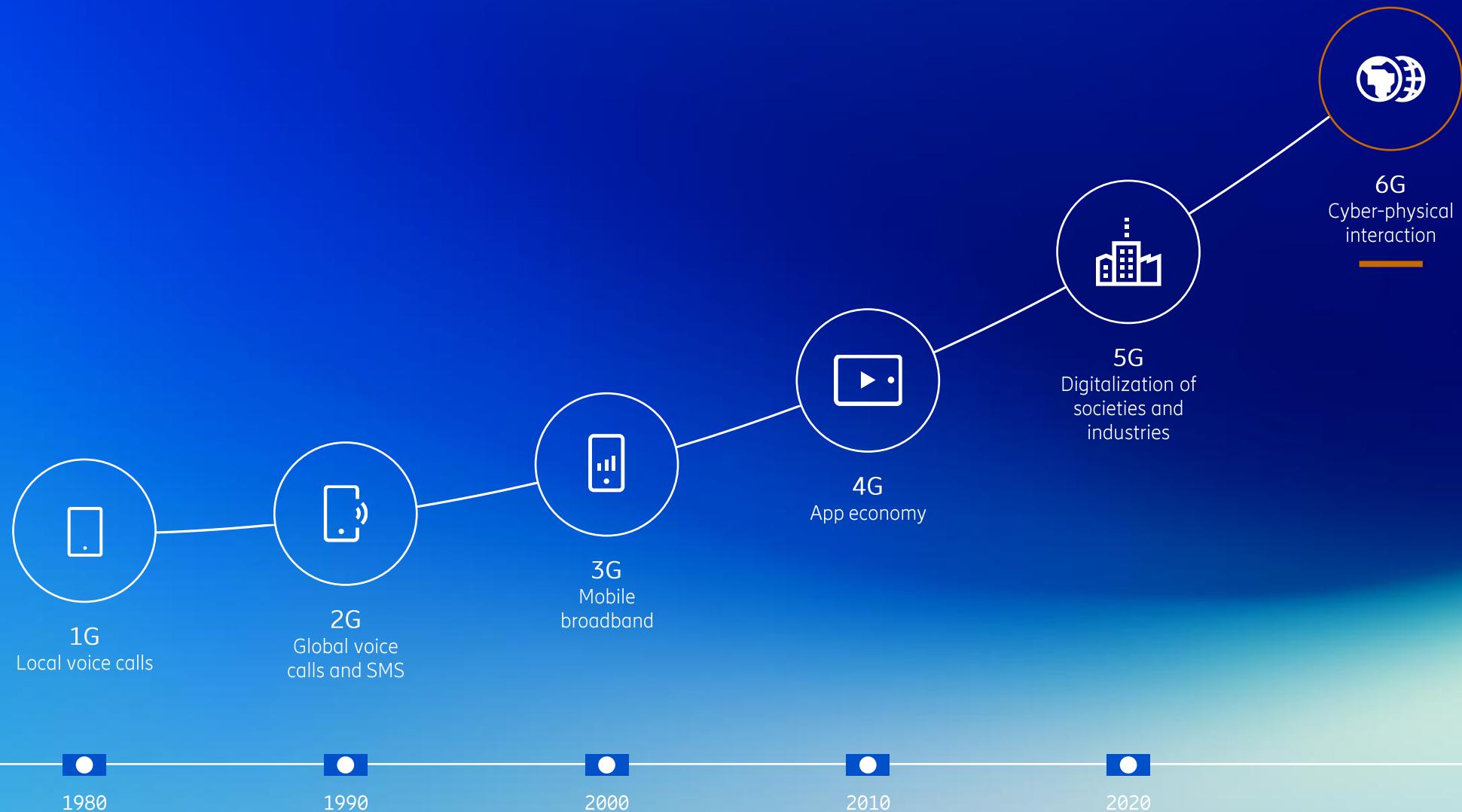
Leading in
performance

5G deployments in the early days and scaling fast.
As a leader, we are investing in our portfolio to make it easier to close that gap.



Note. Data as of August 2024

Driving mobile networks for new waves of innovation





AI for 6G

- Radio and network performance
- Network operations (cost)
- Sustainability
- Network evolution and expansion
- Less algorithm, more learning

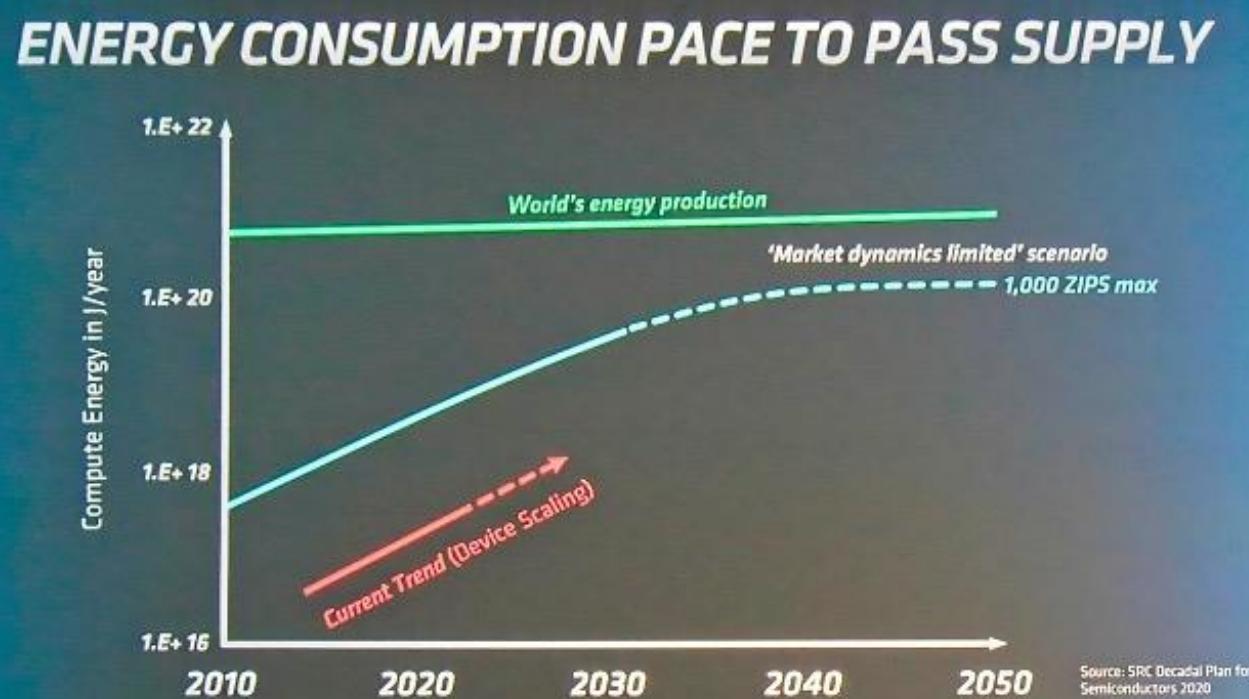
6G for AI

- AI everywhere
- Connecting intelligence
- Verticals use more and more AI
- 6G must support AI chains
- AI communication patterns
- AI data structures

6G will be AI native



AI energy consumption in the world



Semiconductor Engineering

The amount of compute used to train AI systems has been increasing since 1950, the rate of increase increased in 2010

Amount of compute used to train notable AI models

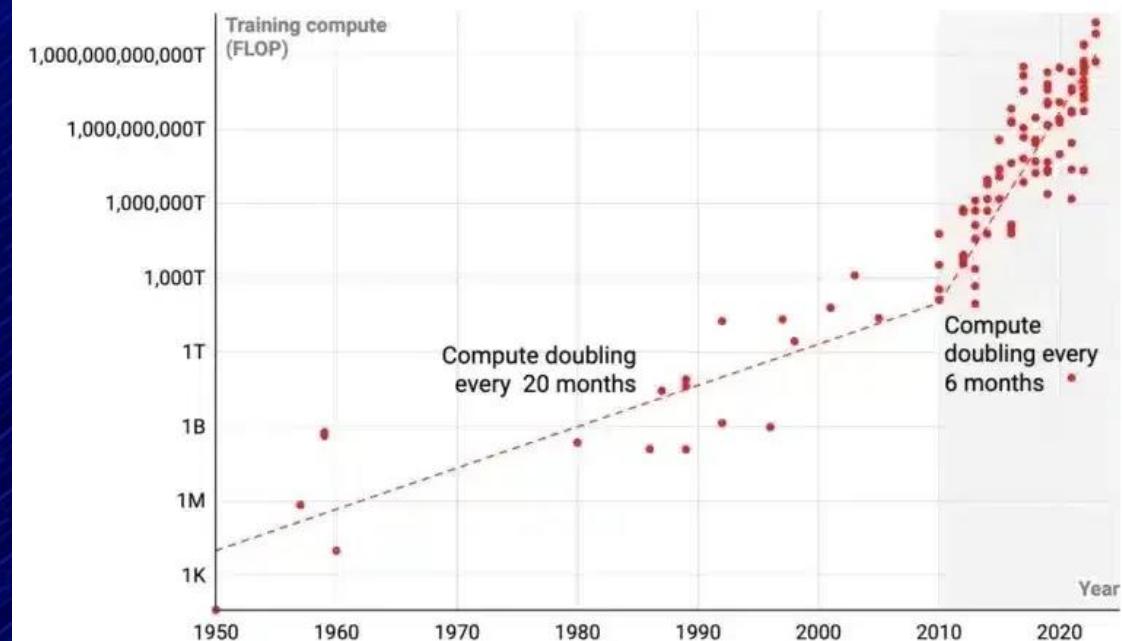


Chart: Will Henshall for TIME • Source: Epoch via Our World in Data

TIME

CarbonCredits

Traditional AI

Future AI must be energy efficient

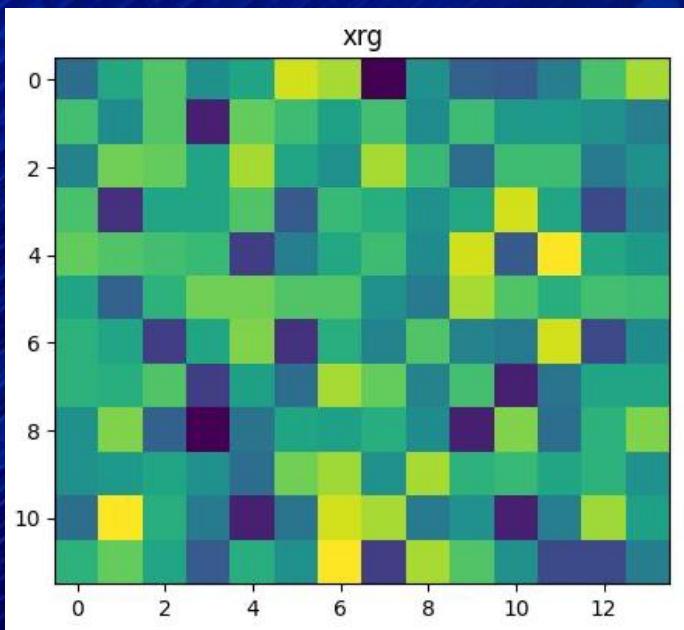
Future AI

- Sparse computation
- Event driven
- Stateful
- Sigma-delta
- Neuromorphic computing
- Low-latency inference



Computation by spikes vs. tensors | Continuous learning | GPT level intelligence in small devices

Channel estimation



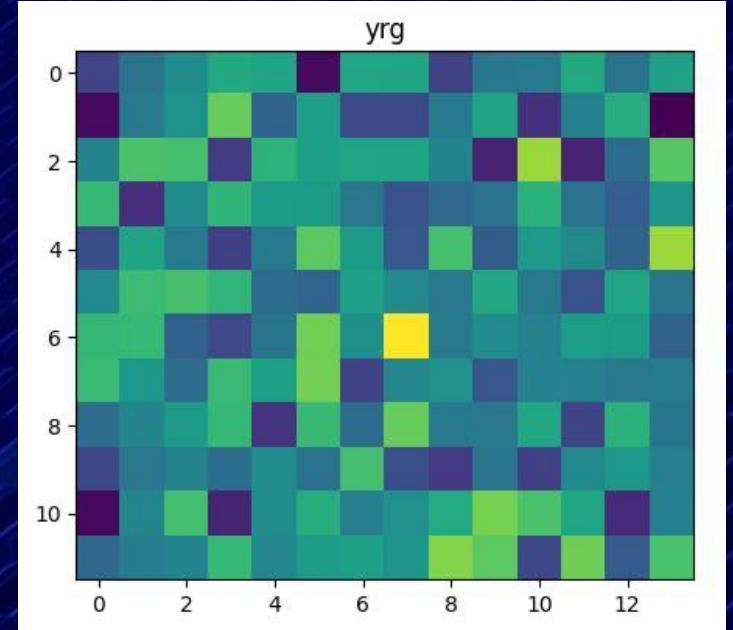
$$Hx + n = y$$

x : transmitted data

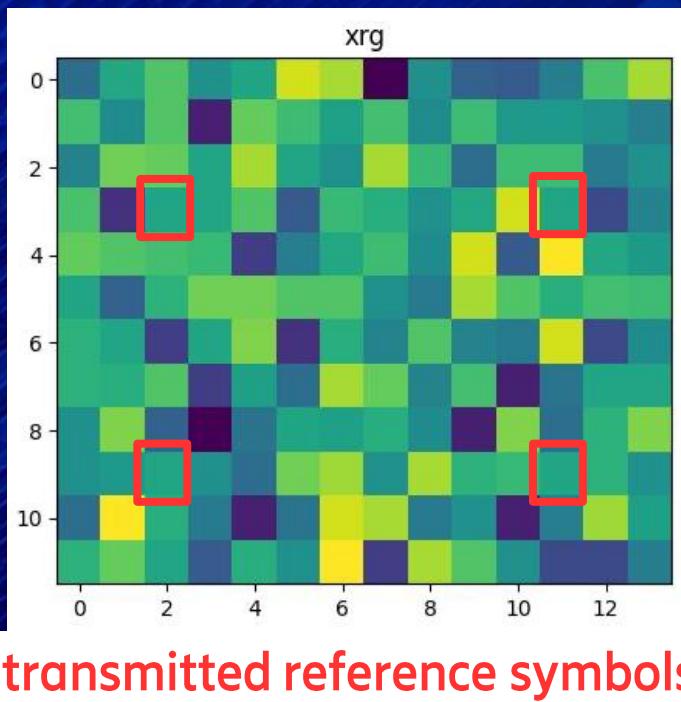
H : channel matrix

n : noise

y : received data

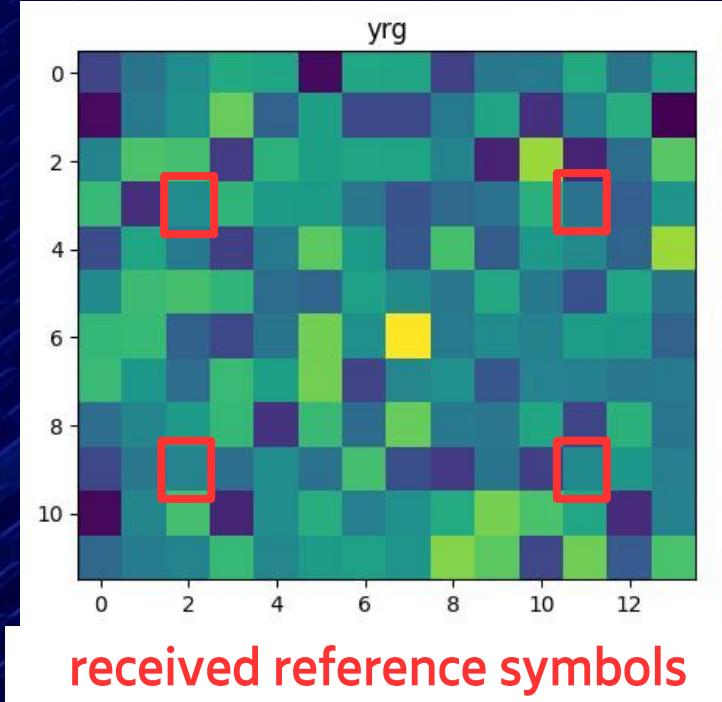


Channel estimation



$$Hx + n = y$$

x : transmitted data
 H : channel matrix
 n : noise
 y : received data

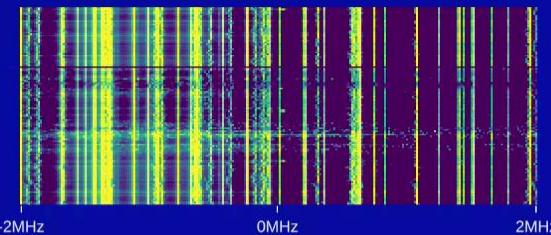


Live demo

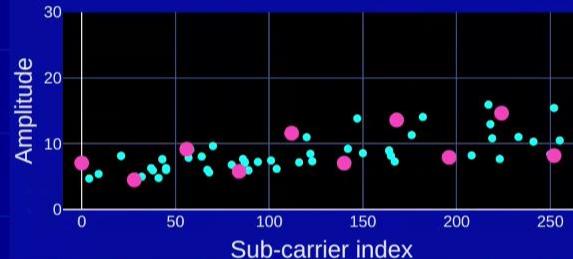


Energy Efficient AI Receiver

Received spectrum



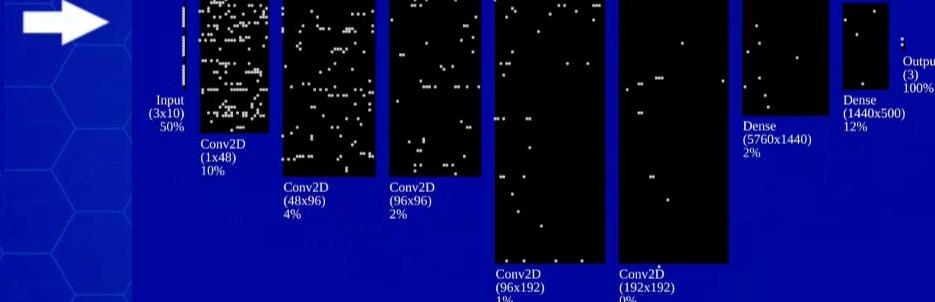
Received symbols



Selected device: #3



Sigma-delta deep spiking neural network



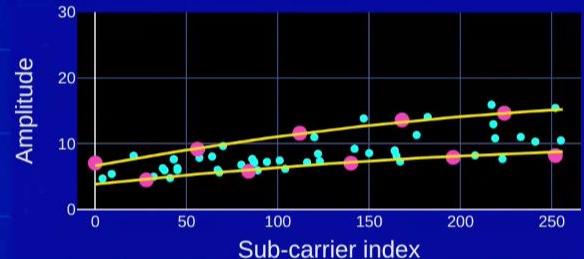
Activation rates



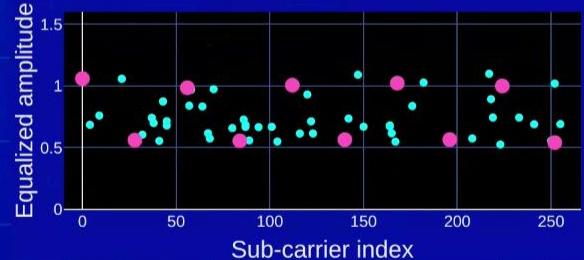
Activation rate: 3%

Live demo

AI-fitted channel model



Equalized symbols





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