



Retele neuronale – Notiuni introductive
COORDONATOR: Prof. Dr. Ing. Virgil Tiponuț
Doctorand: Ing. Alin Brîndușescu



Retele neuronale

Structura rețelei



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- Unitati functionale
- Arhitectura
- Functionare
- Invatare

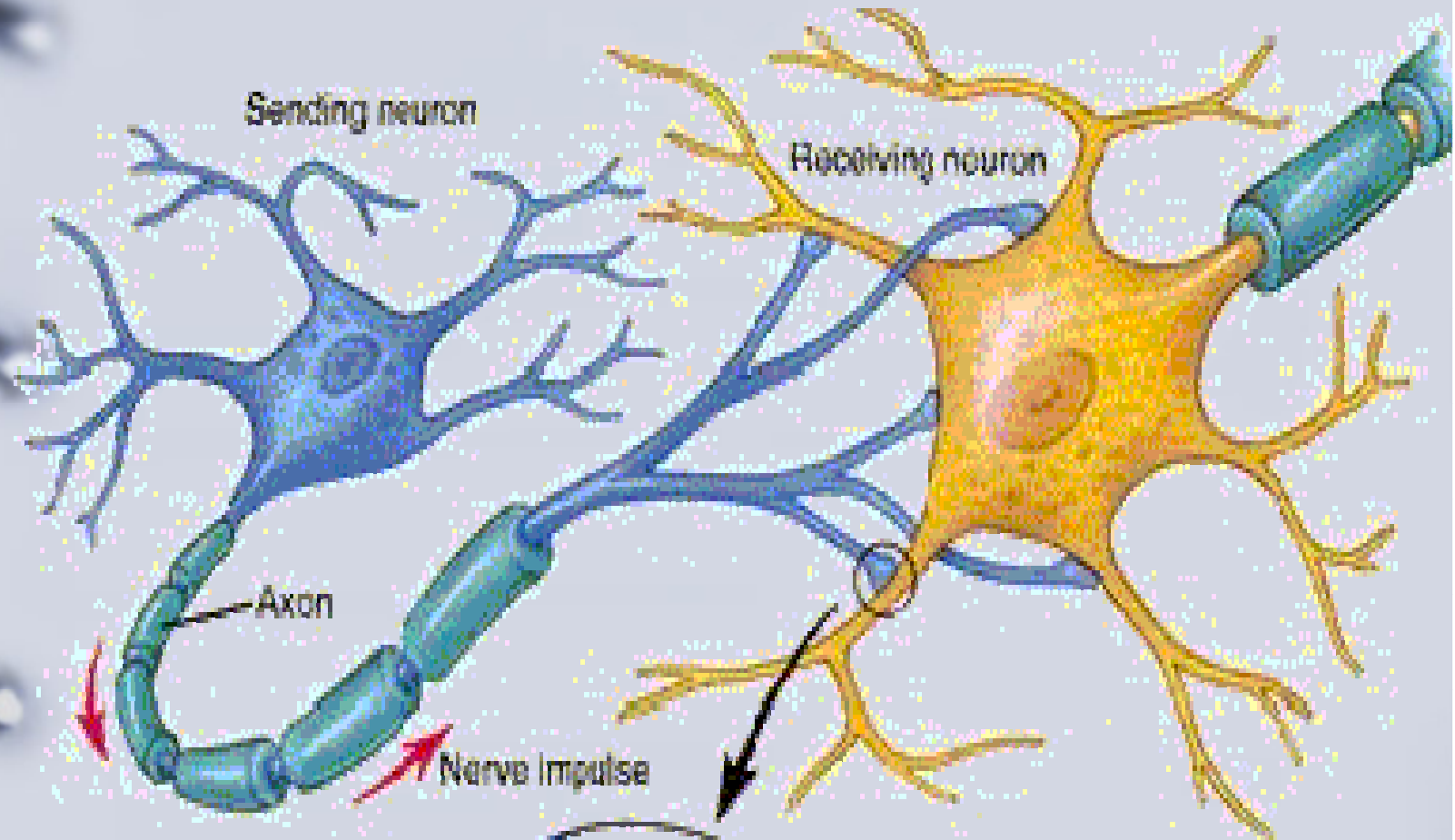




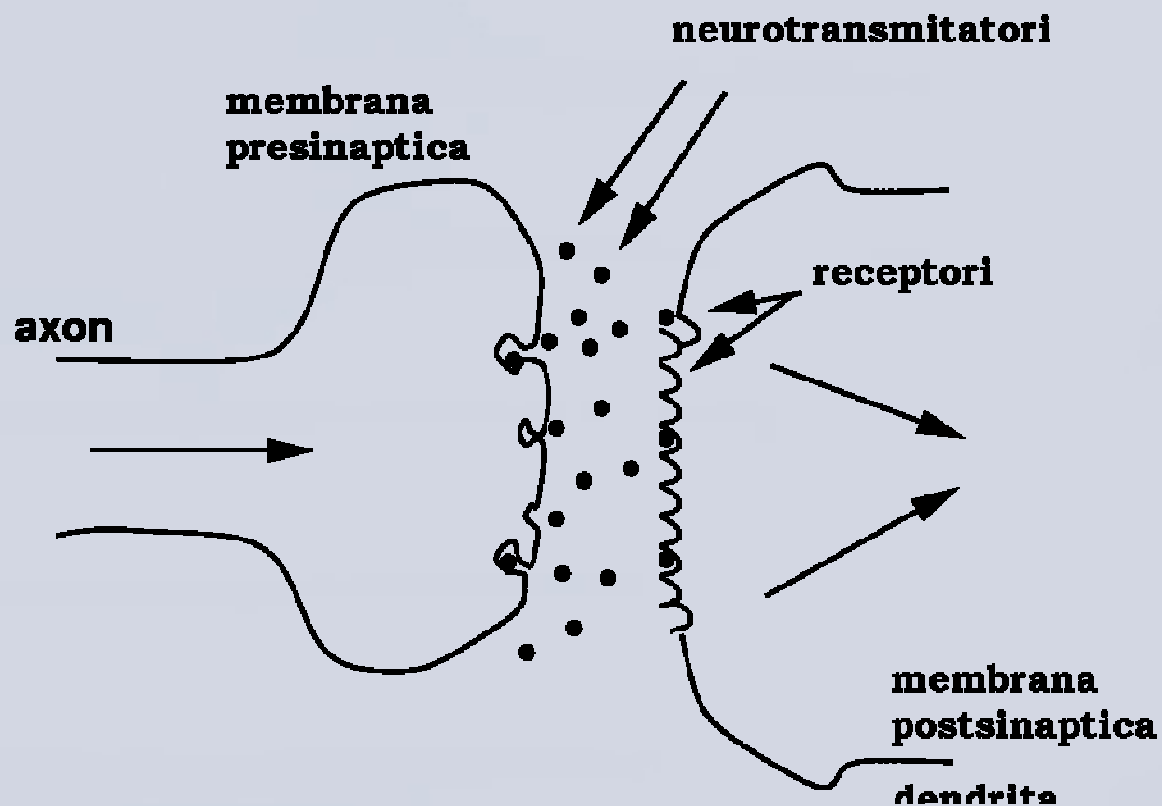
- **Unitati functionale**
 - Modelul neuronului biologic
 - Structura
 - Axon
 - Dendrite
 - Functionare
 - Sinapse
 - Transmitator
 - Potential de actiune (PA)



- **Modelul neuronului biologic**



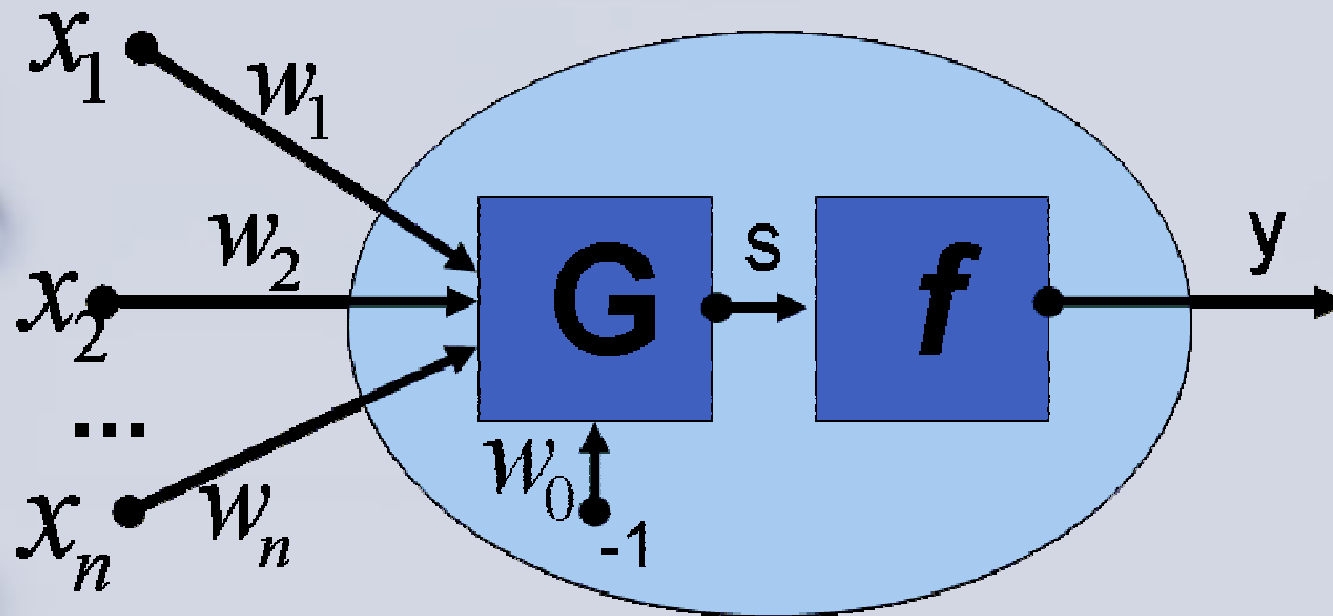
- **Modelul neuronului biologic (cont)**
Sinapsa





- **Unitati functionale**
 - Modelul neuronului functional
 - Ponderi
 - Functia de integrare
 - Functia de transfer
 - Tipuri de unitati
 - Intrare
 - Iesire
 - Ascunse

- Modelul neuronului functional





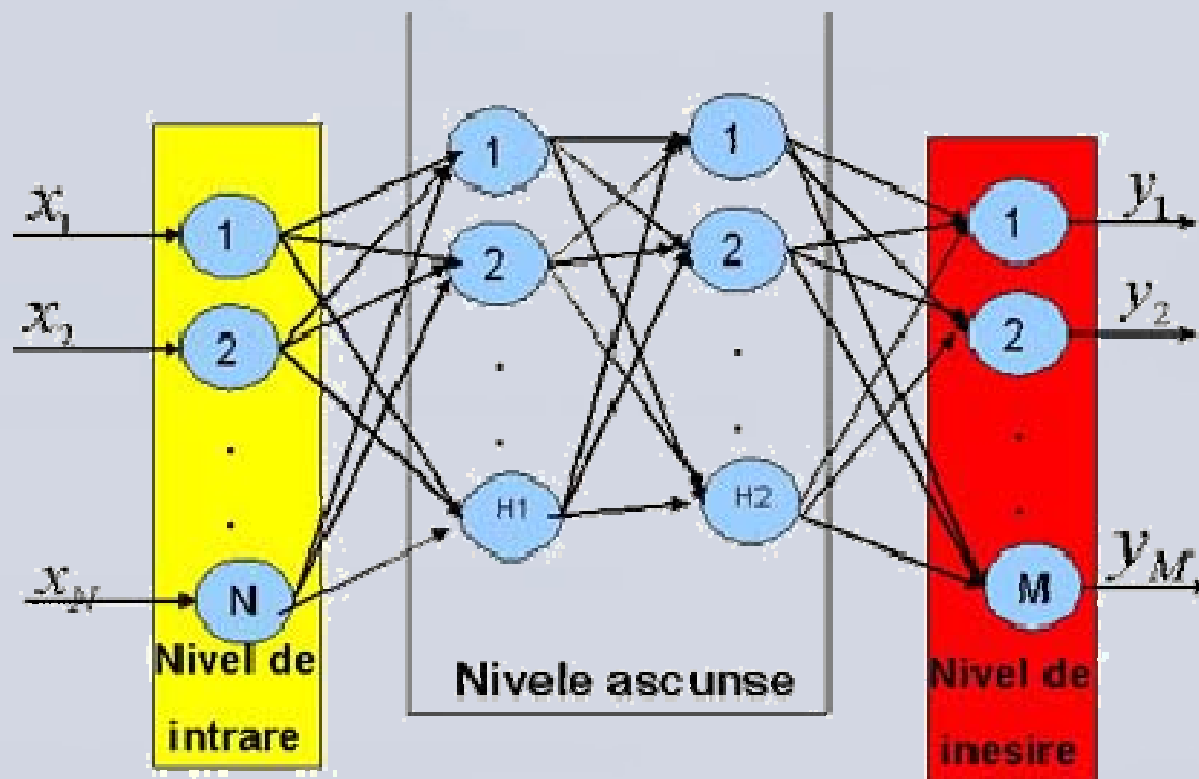
- daca functia de integrare, G , combinatie liniara intre parametri de intrare si ponderile asociate:

$$y = f \left(\sum_{i=1}^N w_i x_i - w_0 \right)$$

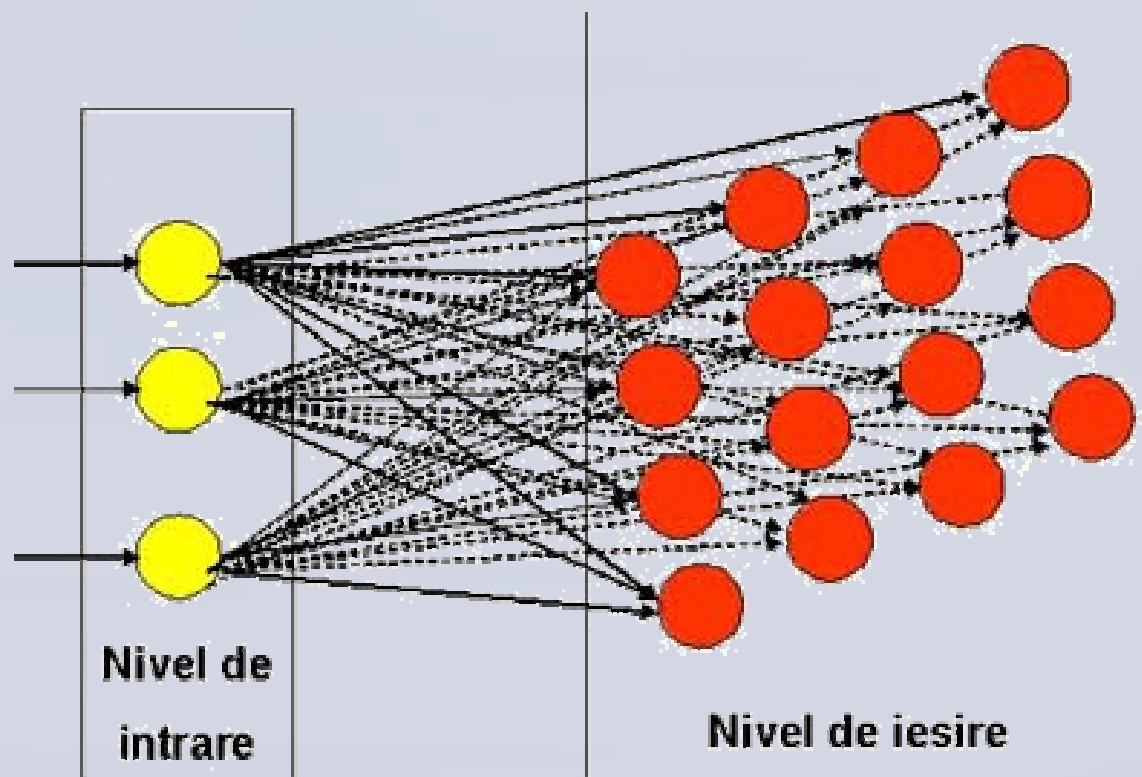


- **Arhitectura**
 - **Topologie**
 - arbitrara
 - pe nivele
 - geometrica
 - **Conexiuni**
 - **Flux informational**
 - Feed-forward
 - Feed-back

- Topologie pe nivele



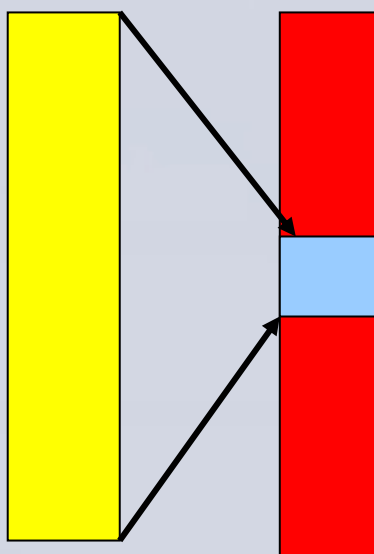
- Topologie cu structura geometrica



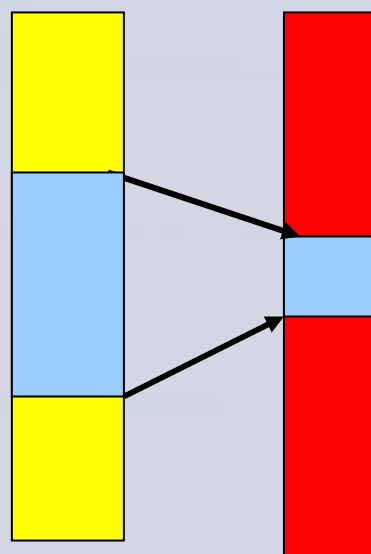


- Conectivitate

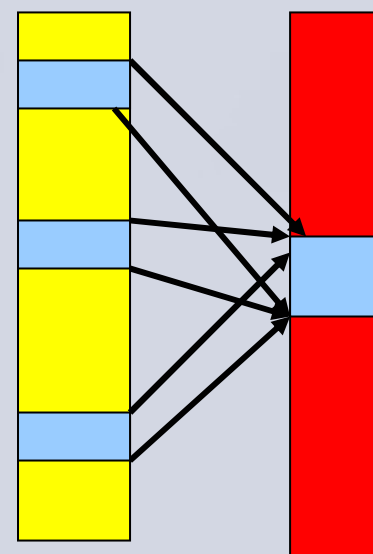
Totala



Locala



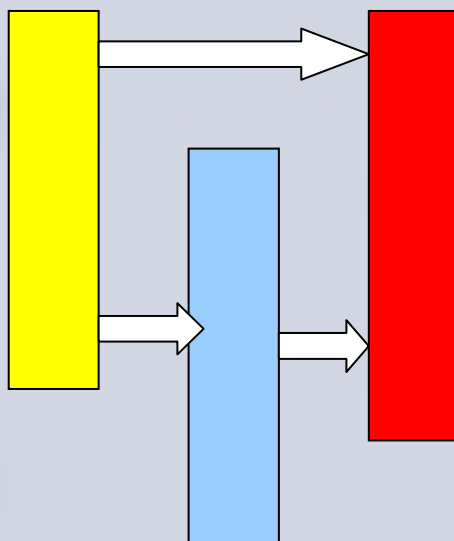
Partiala



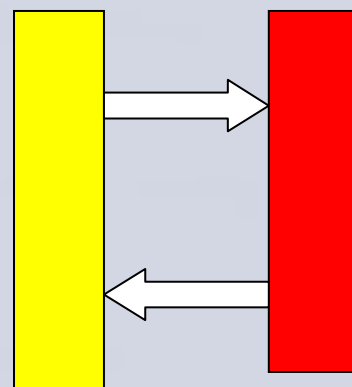


- Conectivitate (cont)

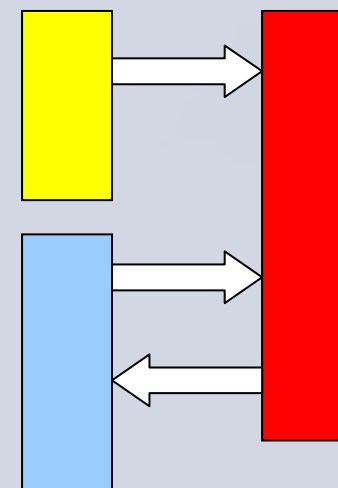
**Peste
nivele**



Bidirecionala



Hibrida





- **Functionare**

- **neiterativa**

- caracteristica rețelelor de tip feed-forward
 - $out = F_w(input)$

- **iterativa**

- caracteristica rețelor recurente
 - $X(0) = X, X(t+1) = F_w(X(t)), t \geq 0$

iesirea se considera limita

$$X^* = \lim_{t \rightarrow \infty} X(t)$$

practic se aproximeaza prin $X(T)$,

T - momentul de oprire al procesului iterativ



- Invatare
 - Supervizata
 - set de antrenare
 - testarea
 - suprainvatarea
 - Nesupervizata
 - trasaturi statistice



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¿Intrebari?

