(a) Adaptation phase

Given: various tasks with measurement data

Task 1   Task 2   Task n
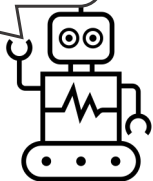
Example of sampled tasks

Sample tasks and compute
$W_j(i) = \text{SGD}(L_{s_i}, \phi_j, k)$, and update weights per the algorithm

The machine learned the learning skills during the adaptation of n tasks.

It is skillful and thus capable of learning new tasks better with limited data.

(b) Reptile

(b1) ϕ_j^1 ϕ_j^2

ϕ_j

$W_j(1)$

(b2)

ϕ_0 ϕ_1

ϕ_j

$W_j(3)$

$W_j(2)$ $W_j(1)$

ϕ_{j+1}

$$\phi_{j+1} = \phi_j + \epsilon \frac{1}{k} \sum_{i=1}^{n}(W_j(i) - \phi_j)$$

$W_j(i)$ ϕ_j

$$\sum_{i=1}^{n}(\quad - \quad)$$

(c) Deployment phase

support   Task $n+1$ generation

make predictions

Task $n+m$

support   generation

make predictions

(d)

required training cycles

Meta learning   Vanilla model