Aalto University

# Distributed Algorithms 2020

## 8a What can you do fast in the LOCAL model?

# What can you do in $T$ rounds in the LOCAL model?

# Best that you can do?

- No restrictions on message size

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- No restrictions on local computation

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  ***in each round, tell each neighbor everything you know!***

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- No restrictions on local computation
- Possible to do, and best that you can do:
  ***in each round, tell each neighbor everything you know!***

**At best:**

in $T$ rounds,
each node can
**learn its radius-$T$ neighborhood**

Your **local output**
is a function of your
**local neighborhood**

*T*-round algorithm is just a **mapping from radius-*T* neighborhoods** to local outputs

# TIME = DISTANCE

# fast = localized

**Running time = number of communication rounds**

until all nodes stop and produce their local outputs

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**Locality = how far do you need to see** in the graph to choose your own part of the solution