

Resilience to climate change: cataloguing urban tree diversity using mobile laser scanning (LiDAR)

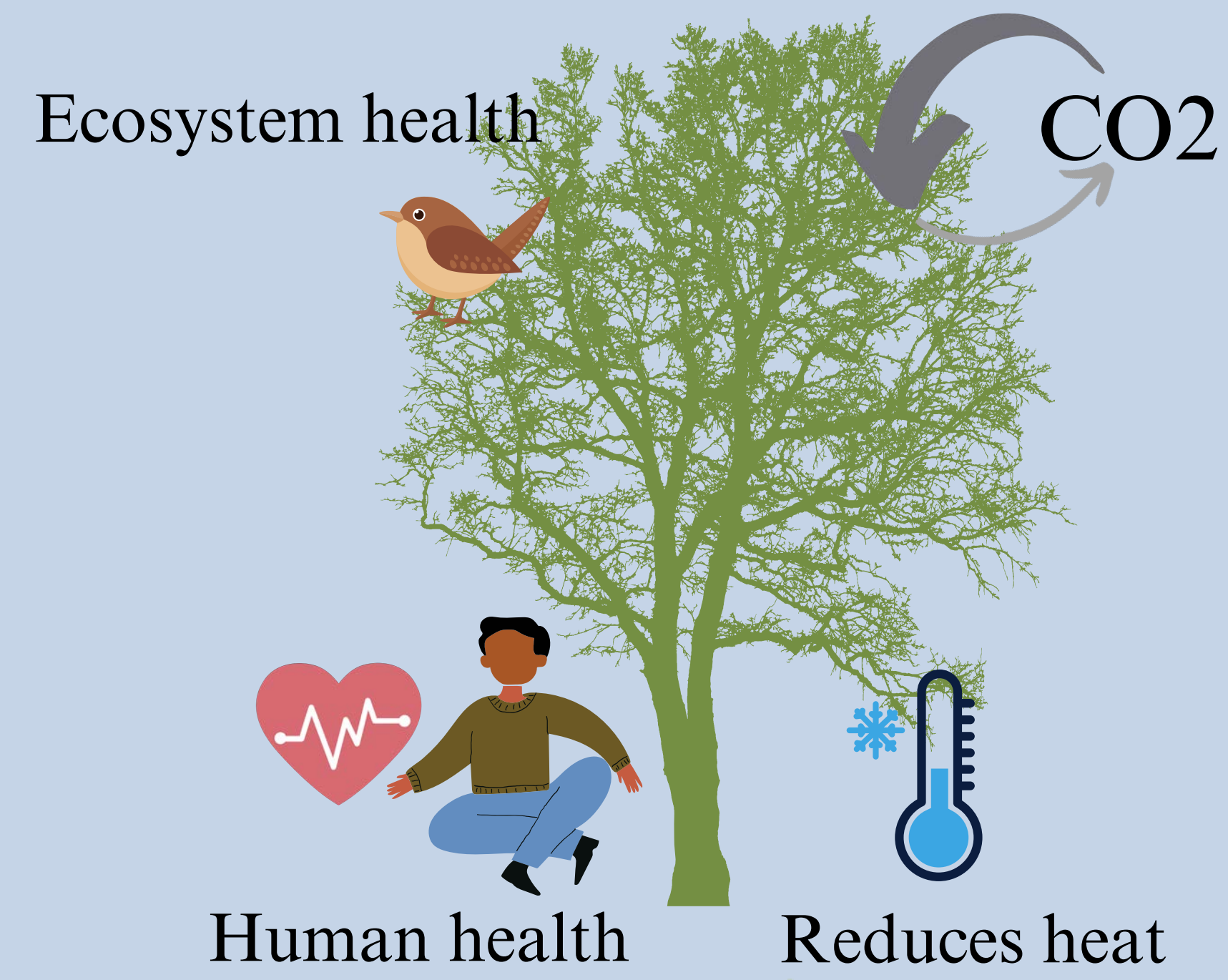


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Importance of diverse urban forests



A diversity of tree species provides a mix of important ecosystem services (ex. water and climate regulation, soil retention, nutrient cycling, etc.)

Ensuring diverse urban forests

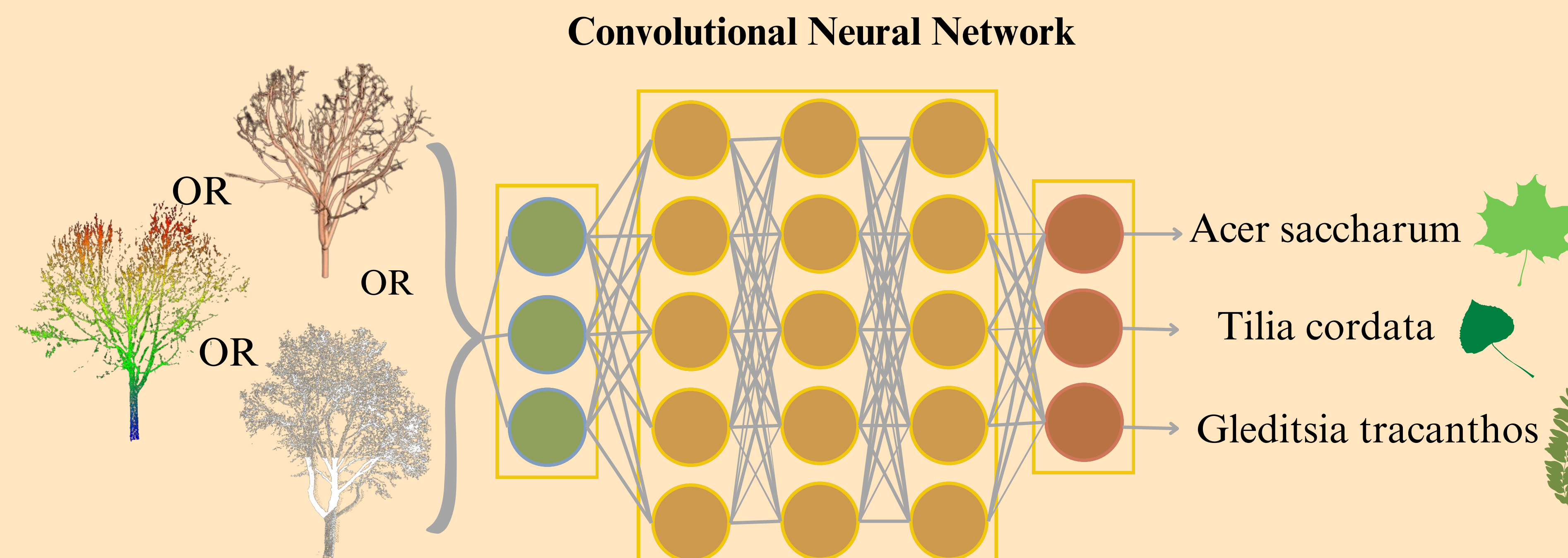
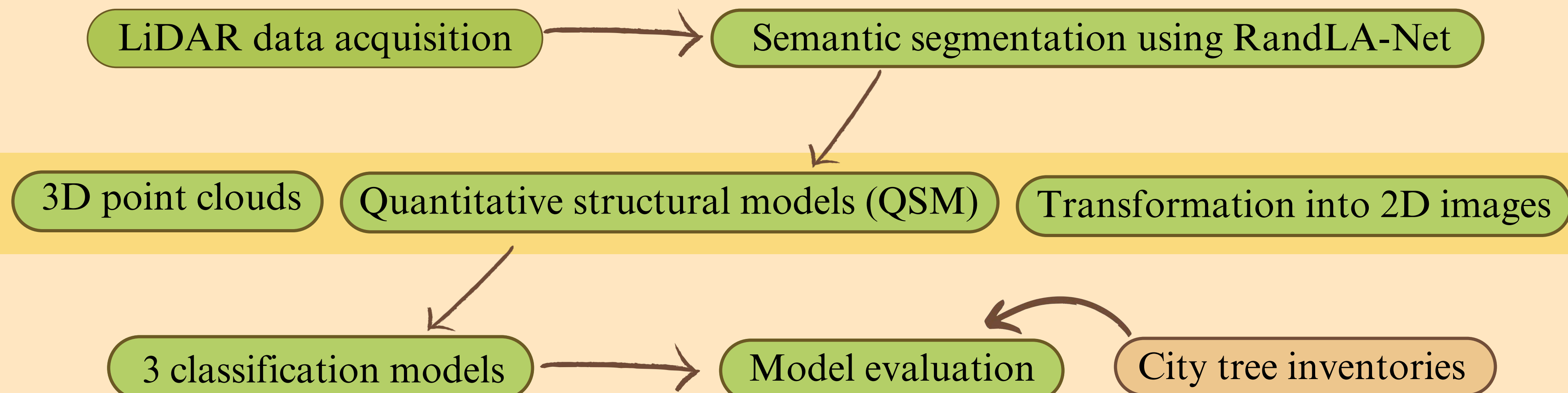
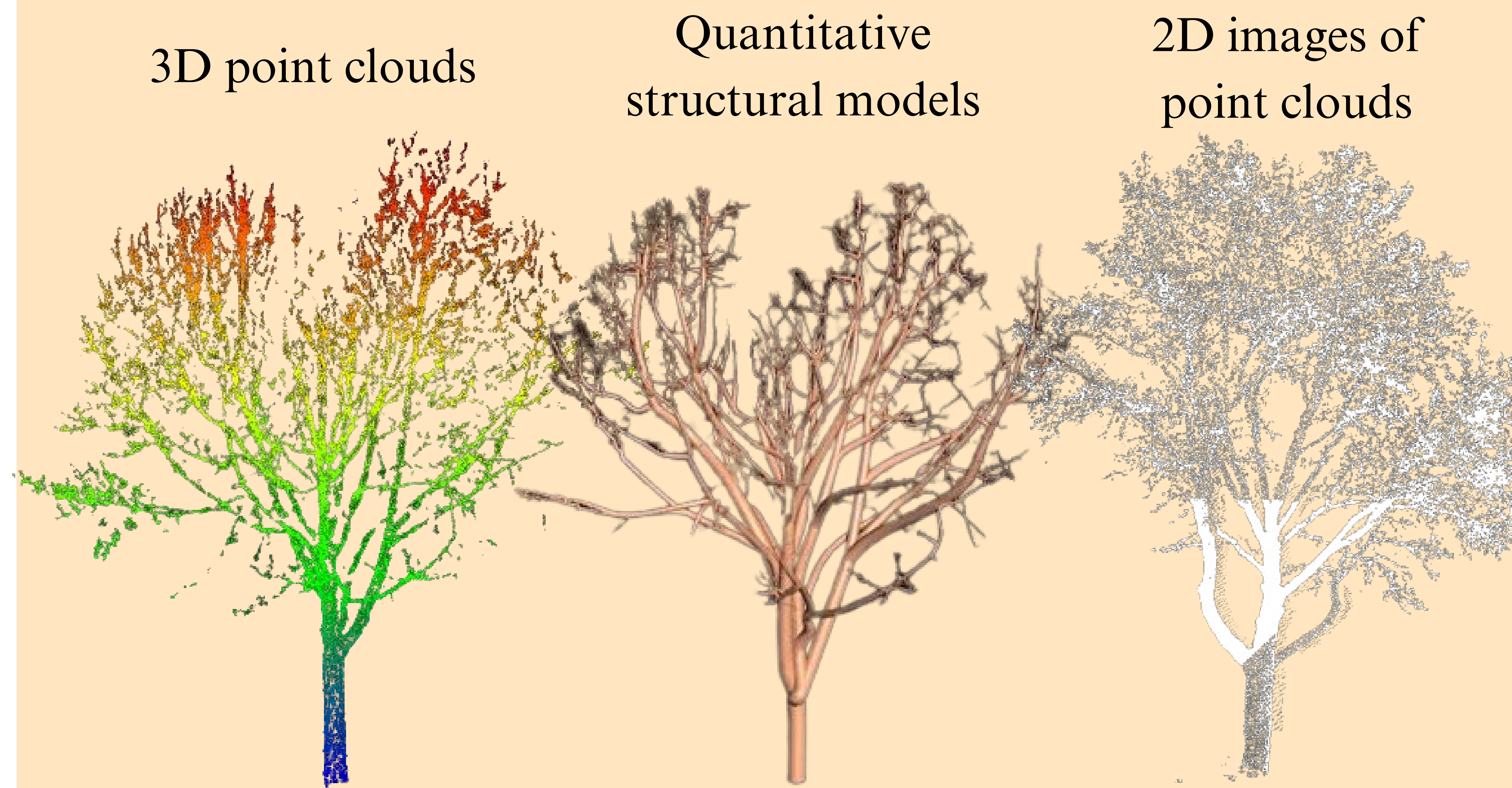
Knowing the state of our urban forests so that we can improve them → Creating an inventory of the city's tree species

Current inventories vs. Potential inventories

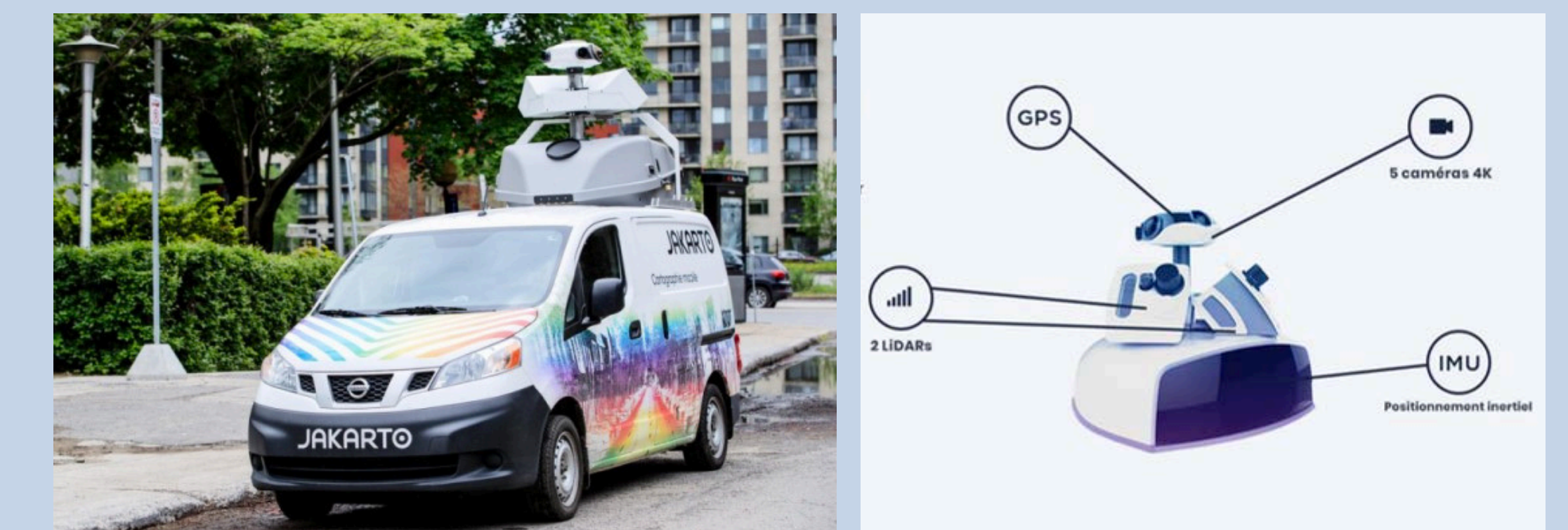
Survey	V.S.	LiDAR
<ul style="list-style-type: none"> • Slow • Expensive time + labour • Incomplete with error • Only public trees 		<ul style="list-style-type: none"> • Fast • Low time + labour • ~Accurate + precise • Detect private trees



How to treat LiDAR data for tree classification?



Mobile laser scanning JAKARTO



Training data : how and where

- Scans performed in 2021
- Scans leaf-on + leaf-off
- Covering over 30 000 trees



Challenges

- Decorations blocking trees
- Incomplete scans

Taxonomic identification

1. Conifers • Pinus
2. Fast growing and shade tolerant • Acer
3. Slow growing and drought tolerant • Ulmus
4. Large seeders and drought tolerant • Quercus
5. Fast growing pioneer species • Populus

The goal : future urban planning

Develop an efficient method to catalogue quantity and distribution of tree species so that city managers are able to build and maintain a diverse urban forest