

---

**Bachelor Thesis Artificial Intelligence**

# **EFFICIENT GENERATION FOR COLLECTIVE DECISION MAKING**

---

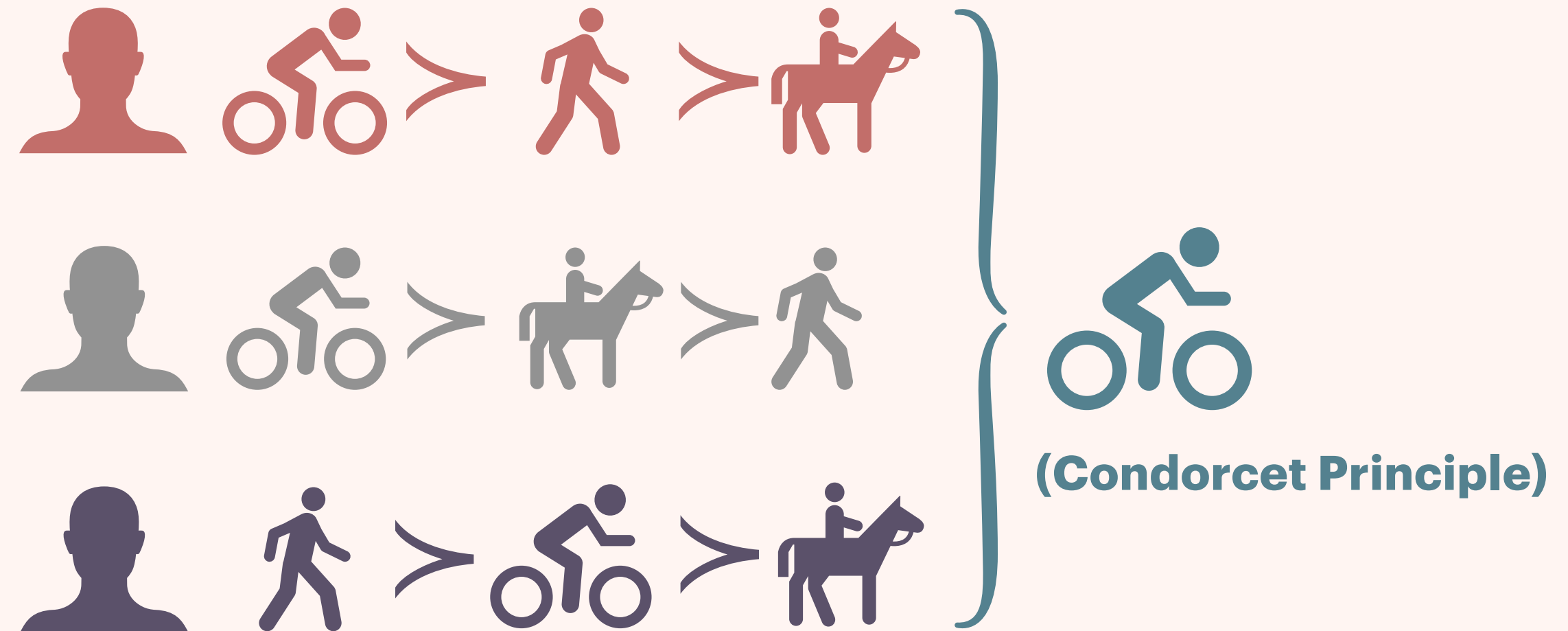
SUPERVISOR: A. BOIXEL (ILLC)

**Nienke Reints, May 15th**

AMSTERDAM

# PROBLEM DESCRIPTION

- **Group Decision**
- **Voting Rules & Axioms**
- **Justification**
- **Efficient**



---

# RESEARCH QUESTION

- **A. Boixel, U. Endriss** 
- **Justification = Explanation + Normative Basis**
- **Efficiency**

---

# METHOD

- **Literature research**
- **Designing the algorithms**
- **Evaluating the efficiency**

# MODEL

- **Agents**  $N^* = \{ \text{red person}, \text{purple person}, \text{grey person} \}$
- **Alternatives**  $X = \{ \text{bicycle}, \text{walking}, \text{horse} \}$
- **Preferences**  $\mathcal{L}(X) = \{ \text{red bicycle} > \text{red walking} > \text{red horse} \quad \text{grey bicycle} > \text{grey horse} > \text{grey walking} \quad \text{purple walking} > \text{purple bicycle} > \text{purple horse} \}$
- **Instances of axioms**  $Inst_{>_{N^*}}(A)$  **A is an axiom**

---

# ALGORITHMS

➤ **Limit number of instances**

➤ **1 profile axioms**

➤ **2 profile axioms**

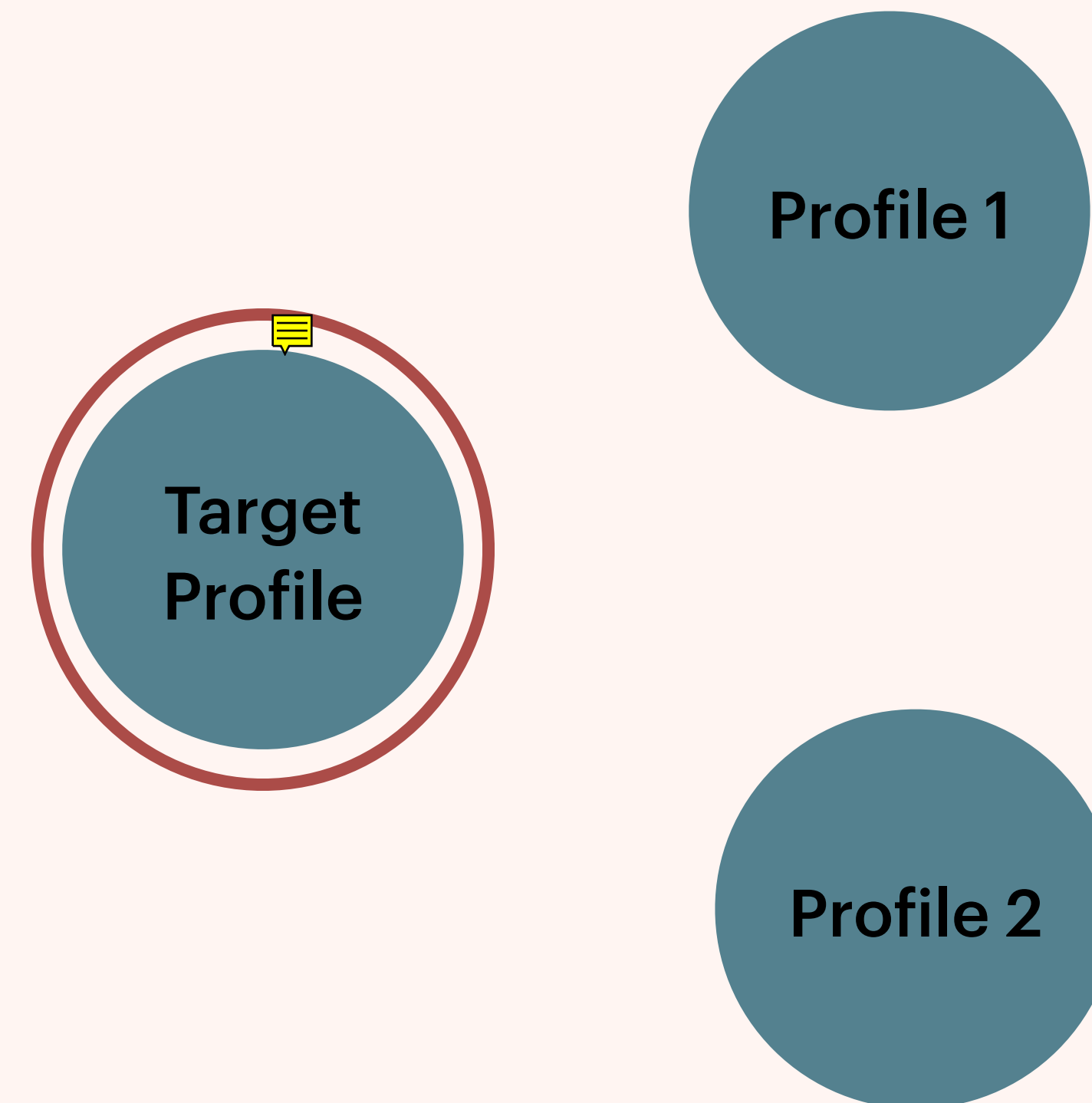


---

# ALGORITHM 1

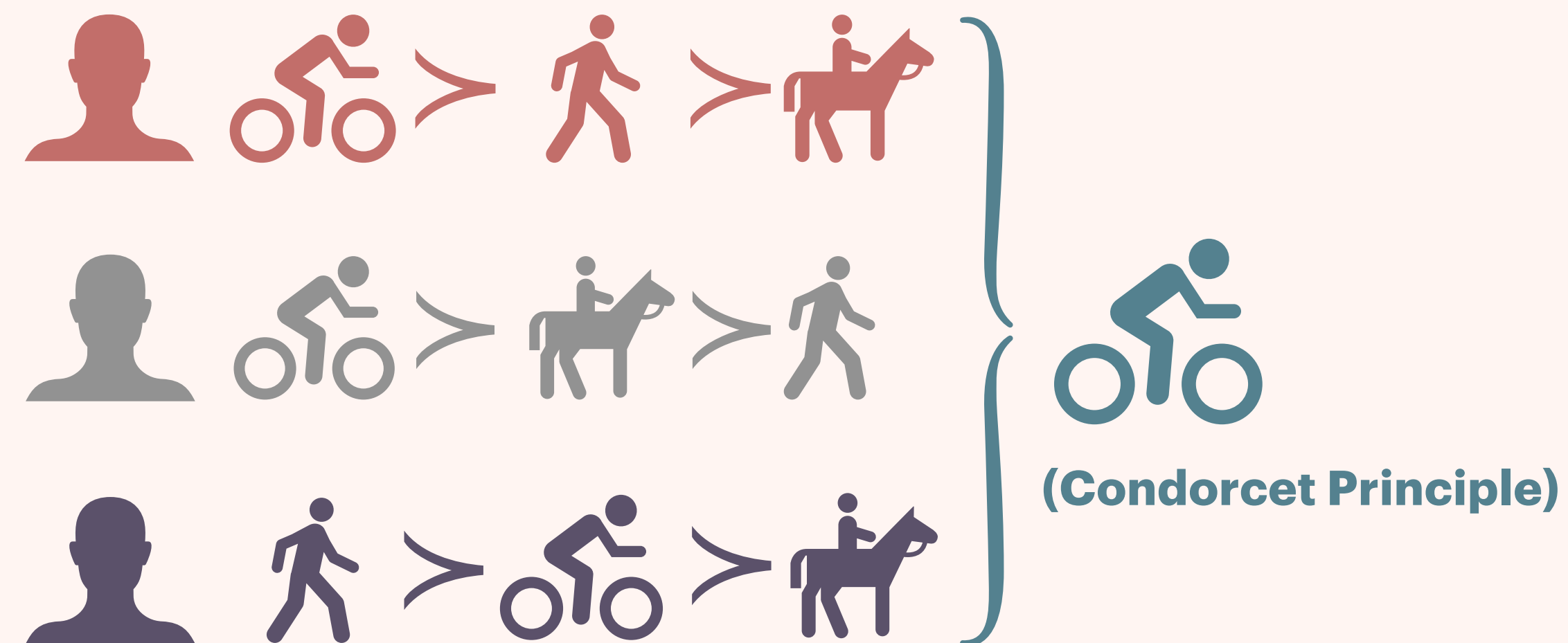
➤ **Target Profile**

➤ **Instances**



# ALGORITHM 1

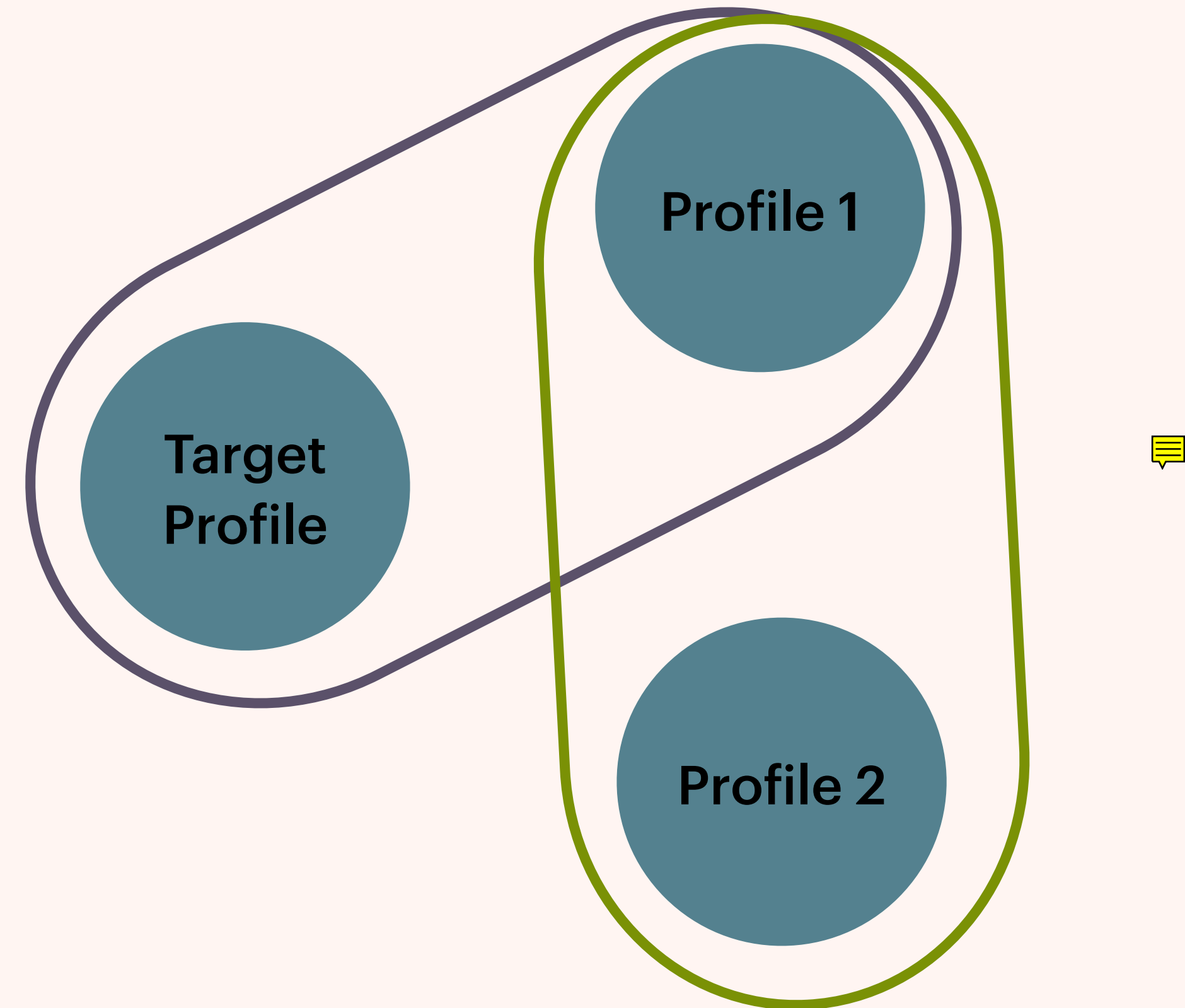
## ➤ Example





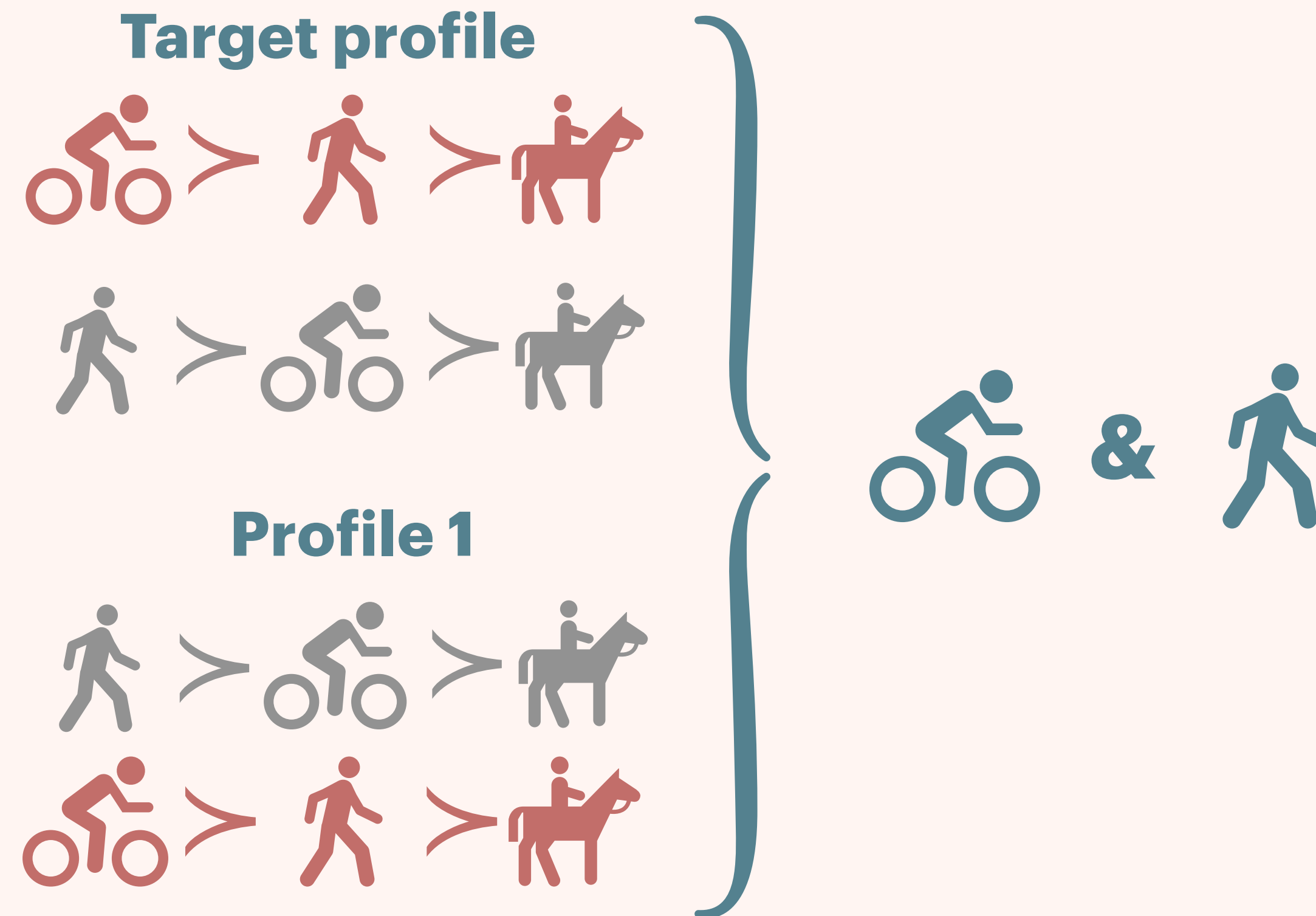
# ALGORITHM 2

## ➤ Breath-first approach



# ALGORITHM 2

## ➤ Example



---

# NEXT MONTH

➤ **Implementation**

➤ **Evaluation**