We define five requirements for robots navigation in human-shared environments:

**R1:** Robustness and safety in navigation.

**R2:** Socially-aware motion planning.

**R3:** Multi-agent coordination.

**R4:** Dynamic environment.

**R5:** Computation efficiency.

Our proposal [1] identifies a hierarchical architecture composed by three layers that work together in order to satisfy the requirements R1 - R5.

We called the layers: Global path planner (GPP), Local path planner + Human motion prediction (LPP-HMP) and Lloyd-based controller (LB).

We depict a scenario where the i-th robot detects the human being presence and acts consequently.

- The GPP computes a path $\mathcal{P}_{g,i}$ accounting for the CAD map, starting from $p_i(0)$ towards the final goal position $e_i$ (at the end of the corridor);
- The HMP computes the future human path $\mathcal{P}_{h}(t, t + T)$ (blue asterisks);
- The LPP generates $\mathcal{P}_{l}(t)$ (dashed orange line);
- The LB generates its “safe zone” (orange area) and computes $v_i, \omega_i$ based on the information from the upper layers.

The triangle point is the information that the LB receives from the LPP, the square point is the one that the LB computes and decides to follow. The solid orange line depicts the past followed path.

Second scenario with multi-agent robots and a static human being.

- The GPP generates the paths $\mathcal{P}_{g,j}$ at the beginning of the mission (Figure A: dashed yellow and orange lines);
- The LPP generates $\mathcal{P}_{l,j}(t)$ for the two agent (Figure B: dashed yellow and orange lines; the solid yellow and orange lines are the past followed paths).
- The LB takes into account also the presence of the other robots and modifies accordingly its safe region (Figure B: yellow and orange areas). Then it computes $v_i, \omega_i$ based on the information from the upper layers.