Siete invitati ad assistere alla seguente

CONFERENZA

Workshop on mobile agents and robots

Wed. January 28th 9.30-12.30
Ca’ Foscari University Scientific Campus
Room 1 - Building ZETA, Via Torino 155, 30172 Mestre - Venice

9.30-9.35 Workshop Presentation

9.35-10.20 Prof. Evangelos Kranakis, Carleton University, Ottawa, Canada:
“Evacuating Robots from an Unknown Exit in a Disk”

Consider $k$ mobile robots inside a circular disk of unit radius. The robots are required to evacuate the disk through an unknown exit point situated on its boundary. We assume all robots having the same (unit) maximal speed and starting at the centre of the disk. The robots may communicate in order to inform themselves about the presence (and its position) or the absence of an exit. The goal is for all the robots to evacuate through the exit in minimum time.

We consider two models of communication between the robots: in non-wireless (or local) communication model robots exchange information only when simultaneously located at the same point, and wireless communication in which robots can communicate one another at any time.

We study the following question for different values of $k$: what is the optimal evacuation time for $k$ robots? We provide algorithms and show lower bounds in both communication models for $k=2$ and $k=3$ thus indicating a difference in evacuation time between the two models. We also obtain almost-tight bounds on the asymptotic relation between evacuation time and team size, for large $k$. 
We show that in the local communication model, a team of $k$ robots can always evacuate in time $3 + 2\pi/k$, whereas at least $3 + 2\pi/k - \Omega(k^{-2})$ time is sometimes required. In the wireless communication model, time $3 + \pi/k + \Omega(k^{-4/3})$ always suffices to complete evacuation, and at least $3 + \pi/k$ is sometimes required. This shows a clear separation between the local and the wireless communication models.

10.25-11.10 Prof. Danny Krizanc, Wesleyan University, Middletown, CT, U.S.A.:

We consider the Dynamic Map Visitation Problem (DMVP), in which a team of agents must visit a collection of critical locations as quickly as possible, in an environment that may change rapidly and unpredictably during the agents' navigation. We apply recent formulations of time-varying graphs (TVGs) to DMVP, shedding new light on the computational hierarchy $R \supset B \supset P$ of TVG classes by analyzing them in the context of graph navigation. We provide hardness results for all three classes, and for several restricted topologies, we show a separation between the classes by showing severe inapproximability in $R$, limited approximability in $B$, and tractability in $P$. We also give topologies in which DMVP in $R$ is fixed parameter tractable, which may serve as a first step toward fully characterizing the features that make DMVP difficult.

11.10-11.40 Coffee Break

11.40-12.10 Presentation of a PhD project on mobile robots

If you wish to participate please contact luccio@unive.it for the workshop registration.

The proposer
Prof. Flaminia Luccio