

iSPOTS: How Wireless Technology Is Changing Life On The M.I.T. Campus.

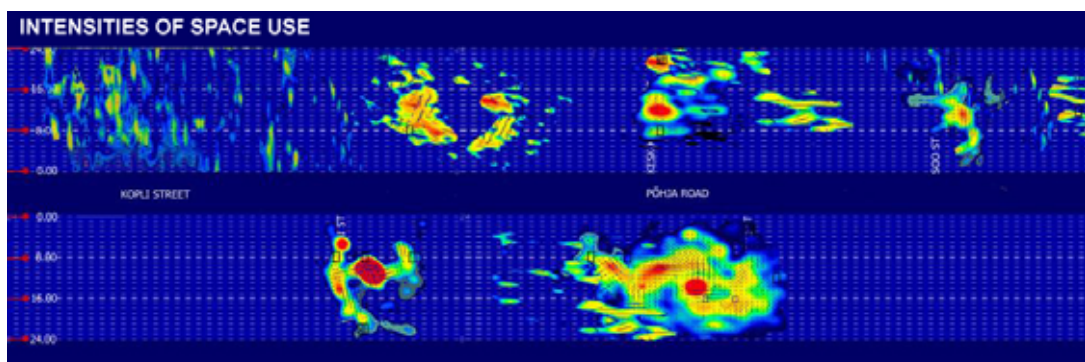
Introduction:

New communication technologies, in particular hand held devices and laptops with wireless connections, are changing the way we live and work. Work, that till recently required a fixed location and defined architectural settings (such as a working desk with a desktop computer and the infamous 'cubicle'), can now be performed in a distributed way from multiple locations. At the same time, conventional hierarchical arrangements of employee management are being replaced by virtual internet-based relationships, creating new patterns and needs for work-spaces. While this trend is widely recognized in the scientific literature (see for instance Francis Duffy, *The new office*, London, 1997), it has not been quantitatively measured in accurate ways yet. The aim of this research is to monitor and collect extensive data of WIFI usage on the M.I.T. campus, which will enable us to better understand the emerging daily working patterns and re-evaluate the qualities of physical space supporting them. The M.I.T. campus is a privileged environment for this research due to its pervasiveness of WIFI connectivity in its community's daily life.

Phase 1:

The initial phase of the project consists of mapping the WIFI coverage on campus through "WIFI sniffing": detecting and identifying all 802.11 networks on campus with a WIFI detector device. This data can be mapped onto a three dimensional plan of the campus and compared with the plan of antenna locations. Subsequently, the anonymous log files of antenna traffic can be employed to monitor the use intensities of all of these WIFI "iSPOTS" in real time, preferably at approximately 5 minute intervals. This data is used to construct an electronic color map, which shows the WIFI coverage and use intensity in real time on a webpage, allowing the MIT community to monitor the campus activities instantaneously on the Internet. When this monitoring is continued for a sufficiently long time (one month), it will highlight how the use of spaces has been modified by WIFI technology.

Compared to fixed working desks and Internet access through LAN cables, WIFI enables people to freely choose where to sit, work etc. Are departmental cubicles now obsolete? Are computer rooms underused? Are students spending more time working remotely from their residences? We gather important data for understanding the shifts in proportions of time spent working from residential places, libraries, cafes, etc., using the Institute's campus as an example for an emerging network society at large.



Urbanmark OÜ 2004, Analyses of Tallinn City

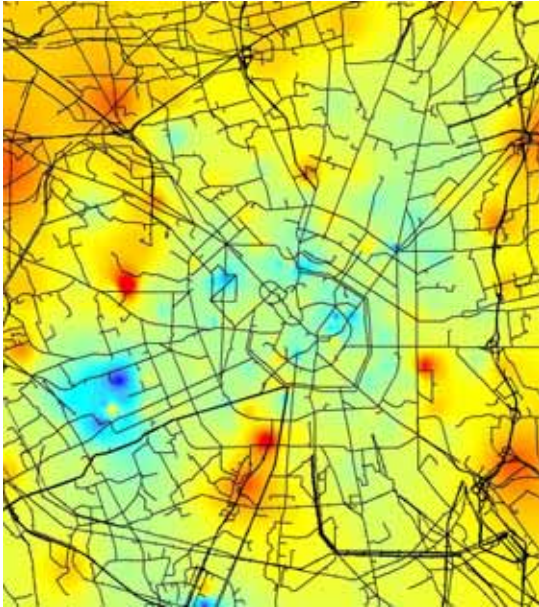


Figure 1 –Map showing areas with different cell phone call density in the metropolitan region of Milan.

Phase 2:

The second phase of the project will enable students to voluntarily make their personal log files and movement patterns of their MAC addresses accessible for others on the web. This would allow friends, who have reciprocally agreed to show their log movement patterns to each other, to track their device locations on the campus map. In order to participate and expose one's MAC or I.P. location on the webpage, participants will register to an agreement on-line and set up an identification profile that will characterize them to other participants. Only participating students can track each others locations on the webpage. The profile identification is similar to many existing internet communities like MSN Messenger, Skype, AOL Messenger and others. Besides providing a new tool of interaction, this project would also allow us to perform a social analysis of the campus exploitation based on individual profile tracking.

Phase 3:

Finally, the project will compare data between M.I.T. and Cambridge University in the United Kingdom. At the current moment, WIFI is almost non-existent in Cambridge University. However, its collegiate structure with multi-use communal spaces, courtyards and gardens, could be an ideal structure to accommodate WIFI into pleasant living / working environments. The spatial qualities of the most popular WIFI areas at M.I.T can provide useful insights for introducing wireless Internet on Cambridge University campus. As a resulting pilot project, unwiring one of the Cambridge UK Colleges and introducing some unobtrusive fixtures that will allow people to work on their WIFI enabled laptops while in the gardens, library, etc., would present an interesting use of the M.I.T. project.

Conclusion:

As a result of this project we hope to gain significant insight into the changing patterns of studying and learning affected by Internet based working environments.

The study will provide undisputed evidence of which areas are most accepted among students for study and work and which are the criteria for choosing among locations. Based on preliminary results of the intensity maps, we can analyze the specific spatial qualities of “iSPOTs” in order to understand what makes one location more popular than another and why certain locations almost never gain use. The results of this analysis can inform MIT’s planning strategy and its definition of research and residential spaces (which, in turn, affect its government funding). More in detail, they can be used for developing a better understanding of buildings’ use patterns, designing new contemporary living / working environments and determining the priorities for providing future WIFI infrastructures. Maybe most importantly, this project seeks to introduce a new real-time feedback planning strategy, urgently needed in today’s rapidly changing society.