

iSocial Periodic Report



The rapid proliferation of Online Social Networking (OSN) sites is reshaping the Internet's structure, design, and utility. It becomes increasingly evident that OSNs create a transformational change in consumer behavior and will bring a far-reaching impact on traditional industries of content, media, and communications. However, centralized Social Networking solutions come with a variety of serious concerns, which include the ownership of personal information, the protection of privacy, OSN interoperability and cross-platform service provision, personal information exploitation by OSN service providers and third parties, and the high cost of maintaining end-user social interactions and data across different OSN platforms. Centralized approaches require a heavy investment in infrastructure in order to maintain performance and scalability, thus leading to further barriers of entry for new service providers and limiting user choice in a market with few competitors. Moreover, such massive infrastructures required to sustain ever increasing demands of OSN applications are becoming excessively power hungry and are expected to surpass the airline industry by CO₂ emissions by 2020. Finally, the dangers of data lock-in become even more pronounced in an ever more likely future scenario where majority of society's digital footprint is controlled by a single OSN provider.

The iSocial ITN aspires to address the aforementioned concerns and bring a transformational change in Online Social Service provision by pushing the state-of-the-art from centralized services towards totally decentralized systems that will pervade our environment and seamlessly integrate with future Internet and media services.

The iSocial consortium, which consists of 7 full partners and 6 associate partners, envisions the emergence of distributed and scalable overlay networking and distributed storage infrastructures that will provide support for open social networks and for innovative social network applications, preserving end-user privacy and information ownership. To meet this goal, iSocial is working on four interconnected research topics:

- i) Overlay Infrastructure for Decentralized Online Social Networking Services
- ii) Data storage & distribution
- iii) Security, privacy & trust
- iv) Modelling and Simulation

The iSocial consortium has employed and provides a world class training for 11 Ph.D. students and 5 post-doctoral fellows who carry out work within the aforementioned research areas. iSocial fellow training has a strong emphasis on combination of advanced understanding in both theoretical and experimental approaches, methodologies and tools that are required to develop Decentralized Online Social Networking platforms. In addition, iSocial ITN funds wide range of training activities and events, ranging from one day workshops and industrial days to intensive post-graduate summer schools.

The iSocial consortium also provides online courses on main iSocial research topics not only to its fellows but also to wider research community.

In the first half of the project, teams of iSocial fellows have focused on studying and developing Distributed OSN architectures, algorithms for efficient data dissemination, protocols and open-source platforms for self-managed overlay networks that provide the run-time environment and the basic communication functionality required by OSN services and applications. Furthermore, the fellows have developed various privacy protection mechanisms, including novel algorithms for risk assessment, access control and policy enforcement as well as protection from spam and other malicious attacks. In addition, the fellows have extensively studied and simulated current OSNs, formulated theoretical graph construction models that govern the evolution of real OSNs as well as identified real-world patterns that are exhibited by OSNs.

The research within iSocial has already resulted in eleven peer-reviewed research papers by iSocial fellows. More detailed descriptions of scientific achievements in the form of bi-annual newsletters can be found on iSocial website: www.isocial-itn.eu.

The project will continue to pursue the vision of Decentralized Online Social Networking (DOSN) services that allow seamless development and deployment of new social applications and services, in the absence of central management and control. The project will maintain the research on the core areas of Distributed Computing, Security, Privacy & Trust, as well as on Modelling and Simulation. By the end of the project we expect to bear a complete portfolio of tools and techniques which are essential for building successful DOSN services. Such tools will help improving performance and fault-tolerance issues of current or forthcoming DOSNs which have a potential to catalyse the wide-scale transition from centralized to decentralized systems thereby addressing important societal considerations on user privacy, energy efficiency and data lock-in.

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