TSSG

The Telecommunications Software & Systems Group (TSSG) is an internationally recognised centre of excellence for ICT research and innovation.

Our core expertise focuses on telecoms networks, security and mobile services. Recognised as one of the top European institutes driving Future internet research, we are part of many European Technology platforms and strategic groups of industry collaborators.

Since our foundation in 1996, we have become an important catalyst for driving economic growth and job creation, through technology innovation, nationally and also in the South East region.

"Over the past 5 years the TSSG Innovation and Commercial Centre (TICC) has delivered an impact for over 90 Irish companies to help improve their competitiveness through problem solving, knowledge transfer and technology development. The TICC has also helped create 11 new start-up companies over this period including FeedHenry Ltd. and ZolkC Ltd. "

- Barry Downes – Executive Director, TSSG Innovation & Commercial Centre.

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Background

Data Fusion International (DFI) Ltd. was established over a decade ago, (formally known as Columba Global Systems Ltd.). It is a leading thinker, innovator and developer of smart, intuitive technology solutions. Their core solution, Infinity, is used in homeland security, financial services and healthcare sectors.

In 2010, Data Fusion International was introduced to the TSSG Innovation and Commercial Centre (TICC) through Enterprise Ireland. TSSG and DFI embarked on a collaborative Enterprise Ireland funded 'Innovation Partnership' project. TSSG worked with DFI to provide data mining technology and a Social Networking Analysis (S.N.A) component for part of their "Infinity" product, which is used by domestic law enforcement agencies in the criminal intelligence domain.

Technology Need

A typical law enforcement agency can find around 20% of the facts it needs about a person of interest from a variety of internal databases, such as police or the prison service databases. The other 80% of intelligence exists external to the authorities in a variety of places online and is known as Open Source Intelligence or OSINT. Newspaper articles, forums posts and social networks can provide a treasure trove of data about a target suspect. However, collating all this information on a single suspect and using it to derive the dynamics of a criminal organisation was hugely problematic.

Technology Solution

The TSSG developed software to automatically extract the complex connections between individual suspects from combined searches across internal data sources and the OSINT. Using these linkages the software automatically created a social network graph of the relationships between persons and organisations. The algorithms used to generate the graphs have also proven valuable in identifying hidden connections and visualising for example, gang dynamics and hierarchies. Combining knowledge available online and applying mining and analytics techniques provided huge insight into previously unknown relationships.

TSSG Innovation and Commercial Centre (TICC)

The TSSG Innovation and Commercial Centre (TICC) is the commercial arm of the TSSG. TICC leverages the scientific research results of the TSSG to deliver innovative research and commercial solutions for Irish industry and Enterprise Ireland High Potential Start-Ups (HPSU).

What the Centre can do for Industry

TICC engages EI's TIME (Telecoms, Internet, Media and Entertainment) cluster of companies) cluster. These companies leverage the TICC's expertise through a variety of R&D services. These services include: knowledge transfer, contract R&D, Innovation Vouchers and Innovation Partnership programmes.

The centre also works with the Waterford Institute of Technology (WIT) Technology Transfer office to provide technology licensing opportunities for developed technologies.

Impact of the Technology

The technology developed by the TSSG was licensed by DFI in September 2011 for international sale and has provided a new product/market opportunity for DFI in the criminal intelligence, financial services and healthcare sectors.

DFI expects the sale and support of this technology to create a number of new jobs and opportunities in Ireland from 2012 onwards.

TSSG

TSSG's Specialist Research Unit:
Social Computing and Data Mining Research Unit

The project for DFI was delivered by the TSSG's Datamining and Social Computing Research Unit (RU) led by Eric Robson. The Data Mining research conducted in the TSSG focuses on accurately discovering the maximum amount of knowledge in the most efficient manner from increasingly large databases, the so called "Big Data" problem. In order to achieve this, our specialised RU researches the full data analysis life cycle – from data gathering to data cleaning and warehousing through to modelling and presentation of results. This study is combined with research in Social Computing where methods are investigated for modelling social behaviour through computational systems. The Unit uses machine learning techniques combined with graph and matrix theory to build representations of social networks. These representations are further mined to give an insight of how people interact with existing ICT services and infrastructure in order to predict and shape the communication networks and services of the Future Internet.

The Data mining and Social Computing Research Unit specialise in techniques such as:

• **Social Networking Analysis:** network and matrix theory.
• **Predictive Analysis:** Classification, Clustering & Association rules mining.
• **Data Warehousing:** ETL, star and snowflake schemas.
• **Semantic Analysis:** Knowledge representations, Annotation, Meaning Discovery, Ontology   matching.
• **Context Awareness:** Information & Data Modelling, Location Based, Smart Spaces, Context Federation & Brokerage.
• **Preferences & Personalisation:** Dynamic and static Preference modelling.

For more information please see: http://www.tssg.org/data-mining-social-computing/

Client Testimonial

"We were delighted to work on a collaborative Enterprise Ireland funded 'Innovation Partnership' project with the TSSG. The technology developed has provided a core part of our overall product offering, providing us with a significant competitive advantage and new product/market opportunities which will result in further job creation at DFI in 2012"

John Collins, CEO, Data Fusion International Ltd.

Contact

For more information on engaging with the TSSG, please contact:

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