

How advanced behaviour modelling is helping to identify online fraud

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Online Slot Game. Credit: shanesapno04 from Flickr Creative Commons

A company that emerged from pioneering research in the Cambridge University Engineering Department is leading the field in the development of software based on predictive behavioural modelling for use in the gaming and financial services sectors. The smart research and technology that underpins Featurespace is earning it comparisons with Autonomy, another big success story that stemmed from research in the same Cambridge department.

Founded in 2005, Cambridge-based Featurespace is fast creating a name for itself as a provider of software that gives companies vital information about their customers by closely monitoring and learning online behavior of millions of people on an individual and constant basis. Using Featurespace software, companies are able to identify both goodies and baddies among their customers – and use this information to

safeguard reputation and improve profitability.

At the core of Featurespace's products are the latest advances in Bayesian inference. Bayesian inference has its roots in a theorem published by Thomas Bayes in the 18th century. Bayesian inference is a perfect fit for today's uncertain world enabling robust adaptation to change over time. Featurespace's significant advancement of this field, combined with its first-hand understanding of what these capabilities can offer to industry, puts the company in a strong position in a worldwide market.

Traditional static approaches to analysis, such as neural networks (an interconnected group of nodes), find a single set of weights for an entire population that maximise the desired result over a historic data set. For all new data, this set of static weights defines how the data should be combined to generate a prediction. Featurespace takes this approach a step further.

Company founder David Excell explained: "Using a Bayesian school of thought, we capture our current understanding and knowledge of the data in a prior model. After observing a new piece of data, our understanding is updated and used to make predictions about future activity. In so doing, we replace the prior model with our updated understanding, thus dynamically adapting to emerging trends in the data."

Most significantly for customers, Featurespace is able to detect fraud, an activity that can potentially destroy or badly damage a company in terms of both its brand and its bottom line. With increasing volumes of high-value transactions taking place online, fraud is an on-going concern for businesses. Featurespace's software manages this risk by building and maintaining an accuracy understanding of good and bad behaviour. The technology is able to pick up many kinds of fraud, including credit card fraud, system exploits and account takeover.

Alerted to the possible instances of fraud, companies can then take measures to prevent it reoccurring – including freezing accounts or restricting their onsite activity. “Most customers are honest and bona fide – but there are the few who are not. When you are talking about millions of customers and less than 0.5% are acting fraudulently, it’s a question of searching for the proverbial needle in a haystack,” said Excell.

Featurespace’s main client base to date is the European online gaming industry, a sector which has shown a 13.1% expansion over the last five years. The gaming industry (chiefly online sports betting, poker, casino games and bingo) in 2010 had a turnover of £18.9 billion with 44.2 million real-money players (figures from H2 Gambling Capital). If the American market is finally liberalised to allow online gambling, which is currently illegal, the market size could double over night, opening up significant new geographic region for Featurespace.

With a solid base in the gaming sector, Featurespace is now expanding into the financial services market to offer similar software and services. Currently employing 20 people, the company is actively looking for 16 more employees to join its team which includes a number of Cambridge alumni. “We’re looking for people who are innovative and dynamic, and enjoy finding solutions to difficult problems,” said Excell.

Featurespace was set up when Australian-born Excell was a PhD student in Cambridge’s Engineering Department and its first home was Excell’s garden shed where the company’s first products were built and deployed to customers. Excell studied engineering and IT at the Australian National University in Canberra and won three scholarships to study for a PhD at Cambridge. “The environment I joined at Cambridge, both in the Engineering Department and at my college, Trinity Hall, really raised my confidence and made me realize what was possible,” he said.

The company began as a consultancy working for local technology businesses, and then began developing fraud detection solutions before becoming a product-based business. “The way we grew is slightly unusual in that we’ve been delivering value to customers’ right from the beginning. Our knowledge of the market meant that we were able to offer products tailor made for the job and we already had a firm customer base to work with,” said Excell.

The comparison with Autonomy has real substance. Both Excell and Autonomy founder Dr. Mike Lynch were supervised by Professor William Fitzgerald, Professor of Applied Statistics at Cambridge’s Department of Engineering. Fitzgerald and Excell set up Featurespace together and Fitzgerald remains on the company board.

Provided by University of Cambridge

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