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http://speedd-project.eu

Final Dissemination Report

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NCSR "Demokritos"

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EXECUTIVE SUMMARY

This deliverable is part of WP2 and contains the final report on dissemination activities carried throughout the duration of the SPEEDD project. This deliverable gives a complete overview of the dissemination material produced and activities undertaken (list of all the papers, presentations, publications and demonstrations published or performed) in the duration of the project.

The dissemination actions of this work package focus on communicating the results of SPEEDD to relevant bodies of interest as widely as possible. Feedback from interested parties shall influence the work of the SPEEDD project and enhance the widespread adoption of the project's results. Such influences range from the fine-tuning of the case studies examined, to the inclusion of additional domain specific requirements in SPEEDD work packages. Results are disseminated to stakeholders within relevant communities that the SPEEDD project addresses. Deliverables *D2.2 Initial communication and dissemination plan* and *D2.7 Interim Dissemination Plan*, have acted as guidelines for the deployment and coordination of all dissemination activities.



1 DISSEMINATION STRATEGY

1.1 SPEEDD DISSEMINATION OBJECTIVES AND OVERALL APPROACH

The main dissemination objective for the SPEEDD project consortium has been to disseminate research findings to various stakeholders including researchers, IT practitioners, industrial and non-profit adopters, enterprises, governmental bodies, and third party agencies in Europe and the USA. This was mainly achieved by documenting and publishing, using various means ranging from online dissemination tools and techniques, to classical dissemination methods such as publications in workshops, conferences and journals, and the organisation of tutorials and workshops.

To target the above-mentioned audiences, the consortium has applied the following dissemination practices:

• Promotional material such as leaflets, presentations, demos and videos were produced and used to help raise awareness by explaining project goals;

• The project's website played an important role in managing SPEEDD's online presence and was used as a gateway to resources from the general public (software, reports, files etc.), commercial and scientific communities, as well as the project partners;

• Social Media channels (Twitter account, LinkedIn group) have been utilised to increase project visibility to wider audiences;

• Scientific conferences and publications: To achieve the best possible dissemination of the project's scientific results to the community, partners held presentations and tutorials in conferences and workshops, and published the findings in journals;

• Workshops have been organised by the SPEEDD project to raise awareness, attract attendees and inform the scientific community.



2 DISSEMINATION ACTIVITIES

2.1 GRAPHIC IDENTITY: SPEEDD LOGO

A project logo (Figure 1) depicting the SPEEDD acronym has been created.



FIGURE 1: SPEEDD LOGO

This logo was presented to, and approved by, SPEEDD project partners. The logo has been used in all documentation (internal and external), deliverables, reports and has also been included in all dissemination material.

2.2 SPEEDD WEBSITE

To ensure maximum visibility of the SPEEDD objectives and results we have set up a project website at the very beginning of the project registered in the "eu" domain with an intuitive URL to help increase hit rates:

http://speedd-project.eu/

The project Web site will remain available for at least three years after the end of the project.

The project website is designed to be used as a portal to provide information for the project. The website was implemented with the Content Management System (CMS) Drupal. Drupal has been chosen because it is open source and a mature platform, used by thousands of organisations and businesses, supported by a worldwide development community. Additionally, it is continuously monitored for security issues by a large community of developers. Furthermore, it is easy to use, allows everyday users to add and update web pages without any significant technical knowledge. Finally, it is dynamic, customizable and can be extended by adding new, or modifying, existing features.

The design of the website builds upon a positive clean-cut visual with the use of light colours and eye catching photos, making it easy to browse the webpage. Information is kept short and links are included leading to websites, publications, etc.

The website is divided in two areas: the public section, which is visible to everyone and the private section (requiring a login) for partners only, which is used as a repository for work (apart from software) conducted within the project.

The public side of the website serves as an overview of the SPEEDD project describing the objectives of the project, presenting consortium members, up-to-date information on progress made with intermediate and final project results, including public reports and highlights such as scientific publications, participation in conferences etc.



The private side of the website encompasses a document management system deployed for the purposes of both internal coordination and external communication of the project's activities.



2.2.1 PUBLIC SECTION OF THE WEBSITE

FIGURE 2: HOMEPAGE OF SPEEDD WEBSITE

The public section of the SPEEDD website (Figure 2):

- Provides a brief project summary highlighting the objectives, the content and the structure of the SPEEDD project;
- Provides a short description of the use cases researched throughout the project and a link to the use cases videos;
- Includes a section with the composition of the SPEEDD Consortium with links to partner websites;
- Provides access to the project's Public Deliverables;
- Provides links to presentations conducted at external conferences in various formats.

2.2.2 PRIVATE SECTION OF THE WEBSITE

The private section of the SPEEDD website is only accessible by Consortium members. The screen shot in Figure 3 shows the private section's homepage.



The aim of the Document Management System at the back-end is to provide a unique resource for all the documentation and reporting created within the project. The SPEEDD Document Management System supports revision control, also known as version control, identified by the revision number and a time stamp of the user making the change.

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Name	~	Size	Туре	Date Modified
🗄 🛅 Admin		8 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
🗉 🛅 DocumentTemplates		0 items	folder	Wed 12 Feb 2014 03:20:40 PM EE
🕑 🛅 Financial		0 items	folder	Wed 12 Feb 2014 03:20:40 PM EE
🗉 🛅 ManagementBoard		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
🗉 🛅 Meetings		1 item	folder	Tue 11 Feb 2014 05:33:49 PM EET
🖂 🛅 Kick-Off		2 items	folder	Wed 12 Feb 2014 11:05:53 AM EE
SAGENDA_SPEEDD_KO.pdf		108.4 kB	PDF document	Tue 11 Feb 2014 05:33:49 PM EET
🛒 minutes.docx		19.0 kB	Microsoft Word Document	Thu 06 Feb 2014 05:15:03 PM EET
🗄 🛅 PR		0 items	folder	Wed 12 Feb 2014 03:20:40 PM EE
🗉 🛅 QualityAssurance		0 items	folder	Wed 12 Feb 2014 03:20:40 PM EE
🕀 🛅 Reports		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
🕑 🛅 TimePlan		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
a 🛅 Contract		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
a 🛅 DoW		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
🗄 🛅 Proposal		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
🗈 🍔 PublicDocuments		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
🗄 🛅 RelevantBibliography		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
🕘 🛅 ResearchPapers		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
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🗈 🎝 WP5-Real Time Visual		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
a 👼 WP6-ScalabilityIntegration		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
a 🐻 WP7-CreditCardFraud		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE
a 🐻 WP8-TrafficManagement		0 items	folder	Wed 12 Feb 2014 03:20:13 PM EE

FIGURE 3: SPEEDD PRIVATE PARTNER AREA

2.2.3 SECURITY ISSUES

As project documents may contain critical information about the project, particular caution measures have been put in place so as to guarantee that sensitive project information is only accessible by authorised users.

In particular:

- Network access to any document content is provided after a user has been authorised using their credentials;
- As an exception, public project documents can be accessed anonymously through the project website;
- Network communication project, restricted documents (non-public) and user authentication is done using encryption mechanisms, in particular the Secure Sockets Layer (SSL) protocol. Access to the documents from outside the NCSR-D local network is only provided to authorised members through SSL encryption.

2.3 SPEEDDFACTSHEETS



The SPEEDD factsheet (Figure 4), which was produced during the first year of the project, summarizes in two pages the concept and objectives of the project including consortium members and the use cases which are being researched in the project.





2.4 SPEEDD LEAFLETS

Project leaflets were designed and produced in two phases and they were part of the project's deliverables. They were used as handouts at relevant events, conferences and meetings. The first version of the leaflets was produced during the first year of the project (Figure 5) while the second version was produced during the second year (Figure 6).





SPEEDD develops a system for proactive event-driven decision-making. Decisions are triggered by forecasting events - whether they correspond to problems or opportunities instead of reacting to them once they happen. The decisions are made in real-time and require on-the-fly processing of Big Data, i.e. extremely large amounts of noisy data storming from different geographical locations as well as historical data.

The effectiveness of the SPEEDD solution will be evaluated in:

• Proactive traffic management, aiming to forecast traffic congestions and, as a result, act in order to attenuate them.

 Proactive credit card fraud management aiming to significantly improve fraud detection accuracy, without compromising detection efficiency, and forecast various types of fraudulent activity, which are constantly evolving, in order to mitigate the effects.



SPEEDD will develop a suite of systems that are capable of processing extremely large and noisy event streams and historical data, in order to recognise and forecast opportunities and threats, make decisions to capitalise on the opportunities and mitigate the threats. Through userinteraction, the systems will help human operators to facilitate correct decision execution.

The SPEEDD methodology for proactive event-based decision-making comprises the following steps:

- Big Data is continuously acquired from various types of sensor and fused in order to recognise, in real-time, events of special significance. To allow for sub-second recognition, SPEEDO minimises communication volume by moving as little data as possible from one place to another.
- The events recognised are correlated with historical information to forecast problems and opportunities that may take place in the near future.
- The forecast events along with the recognised events are leveraged for real-time operational decision-making.
- 4 Visual analytics tools prioritise and explain possible proactive actions, enabling human operators to reach and execute the correct decision.

SPEEDO is funded by the European Commission within the 7th Framework Programme (Grant Agreement No. 619485)





FIGURE 5: SPEEDD LEAFLET 1STVERSION







The effectiveness of the SPEEDD solution is being evaluated in:

• Proactive traffic management, airning to forecast traffic congestions and, as a result, act in order to attenuate them.

 Proactive credit card fraud management, aiming to significantly improve fraud detection accuracy, without compromising detection efficiency, and forecast various types of fraudulent activity, which are constantly evolving, in order to mitigate the effects.





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The SPEEDO methodology for proactive event-based decision-making comprises the following steps:

- Big Data is continuously acquired from various types of sensor and fused in order to recognise, in real-time, events of special significance. To allow for sub-second recognition, SPEEDO minimises communication volume by moving as little data as possible from one place to another.
- The events recognised are correlated with historical information to forecast problems and opportunities that may take place in the near future.
- The forecast events along with the recognised events are leveraged for real-time operational decision-making.
- 4.Visual analytics tools prioritise and explain possible proactive actions, enabling human operators to reach and execute the correct decision.

SPEED Is funded by the Burspean Commission within the fn Framework Programme (Seant Agreement No. 619435





In the first year of the project, the first prototype of the system was developed, incorporating the following innovations:

Advanced event processing technology

- A tool for incremental learning of event patterns.
 Weight learning methods for estimating the confidence
- values of event patterns.
- Extended version of the IBM Proactive Technology Online (Proton) CEP engine to deal with uncertainty.

Proactive event-driven decision-making

- New theoretical results about the optimality of traffic flow modeling were obtained.
- Implementation of a fully distributed decision-making algorithm.

- Adapted stochastic programming methods for the identification of fraudulent credit card transactions.
- Computationally efficient randomized optimization algorithms.
- A connection between randomized optimization methods and machine learning that allowing us to develop new randomized decision-making algorithms.

Visual analytics for real-time interaction with Big Data and proactive decision-support

- User Interfaces addressing detailed user requirements, and based on a theory of work and decision making.
- Systems view of decision-making in the use cases, using Cognitive Work Analysis.

Highly scalable data monitoring

 Developed novel computation-scalable and communication-scalable algorithms to support highly scalable proactive event-driven decision making.



http://speedd-project.eu

FIGURE 6: SPEEDD LEAFLET 2ND VERSION



2.5 SPEEDD MULTI-LINGUAL PRESS RELEASES

The **first batch of multilingual press releases** related to the project was produced by consortium partners and was disseminated in June 2014 to spread the SPEEDD idea. This was also a deliverable produced in the first year of the project "D2.3 Press Release - 1stversion". The press release was translated in six languages (English, Greek, German, Portuguese, Hebrew and French) (see Figures 7-12) and was disseminated by consortium partners to their respective country media. It was also made available on the SPEEDD website and may be accessed here: <u>http://www.speedd-project.eu/sites/default/files/D2.3-Press_Release-v1.pdf</u>

Press Release in English

European project SPEEDD analyses Big Data to anticipate upcoming problems and helps mitigate them pro-actively.

Imagine a computer system that forecasts traffic congestions and helps avoiding them by changing traffic-light priority and electronic speed limits. Imagine a similar system that foresees credit card fraud and helps protect the card owner by placing the card to a watch list. These are the cases selected by the partners of the SPEEDD consortium for demonstrating the innovative technology that will be developed in the project. SPEEDD technology will improve our quality of life, and prevent environmental and economic damage, by anticipating ahead of time a problem that is likely to occur and help prevent it. Similarly, the SPEEDD technology can be used to anticipate opportunities and help capitalise on them. Businesses making smart decisions ahead of time have a significant competitive advantage over their competitors.

To achieve its goal of proactive decision-making, SPEEDD will develop a suite of innovative information systems. First, SPEEDD will develop advanced technology for identifying and processing events at the volume, velocity, variety, lack of veracity and distribution dictated by the Big Data era. Second, fully autonomous or semi-autonomous decision-making systems will be supported by innovative control theory. Third, SPEEDD will produce a visual analytics suite for real-time explanation of, and interaction with Big Data, as well as proactive decision support.

The SPEEDD team combines researchers with complementary expertise from seven orginasations in six countries: the Institute of the Informatics and Telecommunications of the Greek National Center for Scientific Research "Demokritos" (coordinator), IBM Israel — Science and Technology, the IT company Feedzai, the French National Center for Scientific Research "CNRS", the Technion — Israel Institute of Technology, the Swiss Federal Institute of Technology "ETH" and the University of Birmingham.

More information can be found at: http://www.speedd-project.eu Project Coordinator: George Paliouras (paliourg@iit.demokritos.gr)

FIGURE 7: 1STSPEEDD PRESS RELEASEIN ENGLISH (JUNE 2014)



Press Release in Greek

Το Ευρωπαϊκό έργο SPEEDD αναλύει μεγάλους όγκους δεδομένων, προβλέπει προβλήματα και βοηθά στον περιορισμό τους.

Φανταστείτε ένα σύστημα που να προβλέπει τη συμφόρηση της κυκλοφορίας και βοηθά στην αποφυγή της αλλάζοντας τις προτεραιότητες στους φωτεινούς σηματοδότες και τα όρια ταχύτητας Φανταστείτε ένα παρόμοιο σύστημα, το οποίο προβλέπει απάτες με πιστωτικές κάρτες και βοηθά στην προστασία του κατόχου της κάρτας. Αυτές είναι οι περιπτώσεις χρήσεις που έχουν επιλεχθείγια την ανάδειξη της καινοτόμου τεχνολογίας που θα αναπτυχθεί από την ομάδα του έργου SPEEDD. Η τεχνολογία αυτή στοχεύει στο να βελτιώσει την ποιότητα της ζωής μας και να αποτρέψει περιβαλλοντικές και οικονομικές ζημίες, προβλέποντας προβλήματα που είναι πιθανό να συμβούν. Παρομοίως, η τεχνολογία μπορεί να χρησιμοποιηθεί για να προβλέψει ευκαιρίες και να μας βοηθήσει να επωφεληθούμε από αυτές. Οι επιχειρήσεις μπορούν να έχουν σημαντικό ανταγωνιστικό πλεονέκτημα έναντι των ανταγωνιστών τους, λαμβάνοντας έξυπνες αποφάσεις με βάση τις προβλέψεις.

Για να επιτευχθεί ο στόχος της προορατικής λήψης αποφάσεων, στα πλαίσια του ερευνητικό έργου SPEEDD θα αναπτυχθεί ένα σύνολο καινοτόμων πληροφοριακών συστημάτων. Τα δεδομένα τα οποία προκύπτουν από τις περιπτώσεις χρήσης του έργου, χαρακτηρίζονται από τον μεγάλο όγκο τους την υψηλή ταχύτητα με την οποία παράγονται, την μεγάλη ποκιλία και την συχνή παρουσία θορύβου σε αυτά. Στο έργο SPEED θα αναπτυχθούν προηγιένες τεχνικές για την αναγνώριση και την επεξεργασία γεγονότων από δεδομένα μεγάλου όγκου και πολυπλοκότητας, τα οποία δεν μπορούν να αναλυθούν με παραδοσιακές μεθόδους. Στο έργο θα αναπτυχθούν καινοτόμες τεχνικές βασισμένες στην θεωρία ελέγχου που στοχεύουν στην αυτοματοποίηση της λήψης αποφάσεων. Επίσης, θα υλοποιηθεί ένα σύνολο από συστήματα εικονικής αναπαράστασης και ανάλυσης σε πραγματικό χρόνο, για την επεξήγηση των δεδομένων και την προορατική λήψη αποφάσεων.

Στην ομάδα του SPEEDD συνεργάζονται ερευνητές συμπληρωματικών ειδικοτήτων από επτά οργανισμούς σε έξι χώρες. Το Ινστιτούτο Πληροφορικής και Τηλεπικοινωνιών του Εθνικού Κέντρου Ερευνών και Φυσικών Επιστημών "Δημόκραος" (συντονιστής), το τμήμα Επιστήμης και Τεχνολογίας της εταιρίας 1BM στο Ισραήλ, η εταιρία πληροφορικής Feedzai στην Πορτογαλία, το Εθνικό Κέντρο Επιστημονικών Ερευνών Ερευνών της Γαλλίας (CNRS), το Ινστασύτο Τεχνολογίας του Πανεπιστημίου του Technion στο Ισραήλ, το Ομοσπονδιακό Ινστιτούτο Τεχνολογίας (ETH) στην Ελβετία και το Αγγλικό Πανεπιστήμιο του Birmingham.

Περισσότερες πληροφορίες για το έργο: http://www.speedd-project.eu Συντονιστής Εργου: Γιώργος Παλιούρας (paliourg@it.demokritos.gr)

FIGURE 8: 1STSPEEDD PRESS RELEASE IN GREEK (JUNE 2014)

Press Release in German

Das europäische Forschungsprojekt "SPEEDD" ermöglicht präventive Reaktionen auf mittels Big-Data Analysen berechneter Prognosen

Intelligente Verkehrsleitsysteme, die nicht mehr nur auf Staus reagieren, sondern diese vorhersagen können und vollautomatisch Ampeln und Tempolimits anpassen, oder ein Algorithmus, der Kreditkartenbetrug anhand der Transaktionsparameter erkennt und verhindert: Derartige Anwendungen werden im Rahmen des "SPEEDD" Forschungsprojekts untersucht. Die in "SPEEDD" entwickelten, datengestützten Algorithmen sollen dabei eine möglichst frühzeitige Reaktion ermöglichen, um ökonomische und ökologische Schäden abzuwenden. In ähnlicher Weise kann "SPEEDD" auch genutzt werden, um ein günstiges Marktumfeld frühzeitig zu identifizieren. Ein zeitlicher Vorsprung bei der Entscheidungsfindung führt so zu einem direkten Wettbewerbsvorteil.

Zu diesem Zweck entwickelt "SPEEDD" eine Reihe innovativer Algorithmen. Das Fundament bildet ein Systemzur Eventverarbeitung, welches den Anforderungen des Big-Data Zeitalters in Bezug auf Datenmenge, Reaktionszeit, Vielfalt der Daten, fehlende und verfälschte Datenpunkte und Verteilung des Datenaufkommens genügt. Darauf aufbauend kann die Entscheidungsfindung durch optimierte Regelungsalgorithmen weitestgehend automatisiert werden. "SPEEDD" wird ausserdem eine Mensch-Machine Schnittstelle entwickeln, welche die Ergebnisse der Analyse in Echtzeit visuell aufbereitet, weitere Handlungsempfehlungen gibt und auch Eingriffe von aussen ermöglicht.

"SPEEDD" bündelt das Wissen von Forschern aus insgesamt sieben verschiedenen Forschungsinstitutionen und sechs verschiedenen Ländern in einem interdisziplinären Team: Das Institut für Informatik und Telekommunikationstechnik des Nationalen Griechischen Forschungszentrums "Democritos" (Projektkoordinator), das Forschungszentrum IBM Israel, das IT-Unternehmen Feedzai, das Nationale Französische Forschungszentrum "CNRS", die Technische Universität Israel "Technion", die Eidgenössische Technische Hochschule "ETH" Zürich und die Universität Birmingham.

Weitere Informationen: http://www.speedd-project.eu Projektkoordinator: George Paliouras (paliourg @iit.demokritos.gr)

FIGURE 9: 1ST SPEEDD PRESS RELEASE IN GERMAN (JUNE 2014)



Press Release in Portuguese

Projeto europeu SPEEDD analisa Big Data para antecipar problemas iminentes e resolvê-los de forma próactiva.

Imagine um sistema computacional que preveja engarrafamentos e que os evite alterando a prioridade dos semáforos e os limites electrónicos de velocidade. Imagine um sistema similar que preveja fraude em cartões de crédito e que proteja os clientes ao colocar esses mesmos cartões sobre vigilância. Estes são os casos seleccionados pelos parceiros do consórcio SPEEDD para demonstrar a tecnologia inovadora que vai ser desenvolvida no âmbito do projecto. A tecnologia SPEEDD irá melhorar a qualidade de vida e prevenir danos ecológicos e económicos, ao antecipar os problemas que poderão ocorrer. De forma semelhante, a tecnologia SPEEDD pode ser usada para prever oportunidades e capitalizá-las. Decisões de negócio inteligentes antecipadas têm uma vantagem competitiva significativa em relação aos seus concorrentes.

Para alcançar este objectivo de tomadas de decisão de forma pró-activa, SPEEDD irá desenvolver um conjunto de sistemas de informação inovadores. Em primeiro lugar, SPEEDD irá desenvolver tecnologia avançada para identificar e processar eventos num volume, velocidade, variedade, ambiguidade e distribuição ditados pela era da "Big Data". Em segundo lugar, produzirá sistemas completamente autónomos ou quase autónomos para tomada de decisões que serão apoiados por uma teoria de controlo inovadora. Em terceiro lugar, SPEEDD irá criar um conjunto de ferramentas de análise visual para explicações e interacções em tempo real de "Big Data" e auxílio na tomada de decisões.

A equipa SPEEDD combina investigadores com especialidades complementares, divididos por sete organizações e seis países: o Instituto de Informática e Telecomunicações do Centro Nacional Grego para Investigação Científica "Demokritos" (coordenador), IBM Israel - Ciência e Tecnologia, a empresa portuguesa de IT Feedzai, a Centro Nacional Francês para Investigação Científica "CNRS", a Technion - Instituto de Tecnologia de Israel, o Instituto Tecnológico Federal Suíço "ETH" e a Universidade de Birmingham.

Mais informação pode ser encontrada em: http://www.speedd-project.eu Coordenador de Projecto: George Paliouras (paliourg@iit.demokritos.gr)

FIGURE 10: 1ST SPEEDD PRESS RELEASE IN PORTUGUESE (JUNE 2014)

Press Release in Hebrew

פרויקט SPEEDD במימון הקהילה האירופית מנתח Big Data על מנת לצפות בעיות עתידיות ולסייע בהתמודדות יזומה עימן

תארו לעצמכם מערכת מחשב החוזה עומסי תנועה ומסייעת להימנע מהם באמצעות שינוי סדרי הקדימויות בעבודת הרמזורים, והגבלת מהירות התנועה בעזרת שלטים אלקטרוניים. תארו לעצמכם מערכת דומה, המזהה מראש ניסיונות תרמית בכרטיסי אשראי, ומסייעת להגן על מחזקי הכרטיס, באמצעות הצבת נתוניו במסגרת רשימת בקרה והשגחה מיוחדת. התסריטים האלה נבחרו על ידי שותפים בהתאגדות FFFDR לצורך הדגמת הטכנולוגיה החדשנית, שתפותח במסגרת הפרויקט. הטכנולוגיה של STFEDD תשפר את איכות חיינו, ותמנע נזקים סביבתיים וכלכליים, באמצעות צפייה מראש של בעיות וסיוע במניעתן. בדומה לכך, יכולה הטכנולוגיה הזאת לשמש על מנת לזהות הזדמנויות ולזהות בניצולן. עסקים המקבלים מראש החלטות חכמות נהנים מיתרון משמעותי לעומת המתחרים בשוק.

על מנת לממש את יעד קבלת ההחלטות היזומות, יפתח מיזם SPERDD חבילת מערכות מידע חדשניות. ראשית, יפתח SPERDD טכנולוגיה מתקדמת לזיהוי ועיבוד אירועים בנפחים גבוהים, בקצבים מהירים, בשונות גבוהה ובביזור המוכתבים על ידי עידן ה- Big Data. שנית, מערכות אוטונומיות לחלוטין לקבלת החלטות, או מערכות חצי-אוטונומיות, ייתמכו על ידי תיאוריה חדשנית לשליטה. שלישית, ייצור SPEEDD חבילה ויזואלית לניתוח אנליטי שתאפשר הסבר בזמן אמת ואינטראקציה עם Big Data, כמו גם עת כות קבלת החלטות יזומות.

צוות SPFEDD משלב חוקרים בתחומי מומחיות משלימים משבעה ארגונים בשש מדינות: המכון למחשוב ולתקשורת במרכז הלאומי למחקר מדעי דמוקריטוס "NCSR "Demokritos, יוון המתאם את הפרויקט; קבוצת המדע והטכנולוגיה של יבמ; חברת טכנולוגיות המידע (RCNRS המרכז הלאומי של צרפת למחקר מדעי CNRS; הטכנין בחיפה; המכון הפדראלי השווייצי לטכנולוגיה אוניברסיטת בירמינגהם.

http://www.speedd-project.eu מידע נוסף ניתן למצוא ב:

(paliourg@iit.demokritos.gr) Paliouras George מתאם הפרויקט:

FIGURE 11: 1ST SPEEDD PRESS RELEASE IN HEBREW (JUNE 2014)



Press Release in French Le projet Européen SPEEDD a pour but l'analyse de données massives (Big Data) pour anticiper les problèmes à venir et aider à les résoudre de manière proactive. Imaginez un système informatique qui prévoit avec précision les congestions dans le trafic routier et aide à les éviter en contrôlant dynamiquement les feux tricolores et les panneaux de limitation de vitesse. Imaginez un autre système qui prévoit les fraudes liées aux cartes de crédit et qui protège le propriétaire de la carte en plaçant la carte sur une liste de surveillance. Ces deux cas d'étude ont été sélectionnés par les partenaires du consortium SPEEDD pour démontrer et valider la technologie innovante qui sera développée dans le projet. La technologie SPEEDD améliorera la qualité de vie et préviendra des dommages environnementaux et économiques, en anticipant avant son occurrence un problème qui pourra probablement se produire et en aidant à l'éviter. De même, la technologie SPEEDD pourra être utilisée pour anticiper de nouvelles opportunités et aider à les exploiter. Des entreprises capables de prendre à l'avance des décisions intelligentes auront un avantage conséquent par rapport à leurs concurrents. Pour atteindre son objectif de prise de décision proactive, SPEEDD développera un ensemble de systèmes informatiques innovants. Premièrement, SPEEDD développera une technologie avancée pour identifier et traiter des événements ayant les caractéristiques propres aux données massives en termes de volume, variété, manque de fiabilité et distribution. Deuxièmement, des systèmes de décision entièrement ou partiellement autonomes seront mis en œuvre sur la base de la théorie des systèmes et du contrôle (automatique). Troisièmement, SPEEDD produira une suite d'outils d'analyse visuelle pour une analyse en temps réel des données massives et une interaction avec celles-ci, ainsi que pour une aide à la décision proactive. Le consortium de SPEEDD combine des chercheurs avec des expertises complémentaires, provenant de sept organismes de six pays différents : l'Institut d'Informatique et Télécommunications du Centre National Grec pour la Recherche Scientifique "Demokritos" (coordinateur), IBM Israel - Science et Technologie, l'entreprise Feedzai, le Centre National pour la Recherche Scientifique en France CNRS, Technion - Institut de Technologie Israélien, l'Ecole Polytechnique Fédérale de Zurich ETHZ, et l'Université de Birmingham. Pour plus d'informations: http://www.speedd-project.eu Coordinateur du projet: George Paliouras (paliourg@iit.demokritos.gr)

FIGURE 12: 1ST SPEEDD PRESS RELEASE IN FRENCH (JUNE 2014)

The **second batch of multilingual press releases**was produced and disseminated in June 2016. The press release was translated in six languages (English, Greek, German, Portuguese, Hebrew, and French) (see Figures13-18) and was disseminated by consortium partners to their respective country media. This was also a deliverable of the project "D2.10 Press Releases - 2nd version". This second press release summarises the first two years of the SPEEDD project and is available on the SPEEDD website here: <u>http://speedd-project.eu/sites/default/files/D2.10-Press Releases-v2-revised.pdf</u>



FIGURE 13: 2ND SPEEDD PRESS RELEASE IN ENGLISH (JUNE 2016)



"Το πλήθος, η ποικιλομορφία, αλλά και η αθεθαιότητα που κυριαρχούν στις μεγάλες ροές δεδομένων αποτελούν τόσο μια μεγάλη πρόκληση όσο και μια ανεπανάληπτη ευκαιρία για εμάς" αναφέρει ο συντονιστής του SPEEDD, Γεώργιος Παλιούρας, από το ΕΚΕΦΕ "Δημόκριτος". "Η αναγνώριση και η πρόθλεψη σύνδετων γεγονότων, όπως αυτά που αφορούν χρηματοπιστωτική απάτη, αλλά και προληπτική λήψη αποφάσεων απαιτεί συνδυασμό καινοτόμων τεχνολογιών. Αυτός ακριθώς ο συγκερασμός είναι το στοιχείο που κάνει το SPEEDD μια τόσο ενδιαφέρουσα προσπάθεια!"

Μπαίνοντας στον τελευταίο χρόνο του έργου, το SPEEDD οδεύει προς την επίτευξη του τελικού στόχου που είναι η δημιουργία ενός

FIGURE 14: 2ND SPEEDD PRESS RELEASE IN GREEK (JUNE 2016)

Press Release in French

Est-il possible de prédire et d'empêcher l'apparition des bouchons dans le trafic urbain? Peut-on faire de même pour les fraudes à la carte bancaire? Telles sont certaines des questions cruciales auquel le projet de recherche européen SPEEDD se consacre.

Durant sa première année, SPEEDD a rassemblé des leaders du monde académique et de l'industrie pour développer une technologie capable de prédire et de contrôler de manière automatique des évènements significatifs. SPEEDD est un projet collaboratif entre le Centre National Grec pour la recherche scientifique « Demokritos » (Coordinateur du projet), IBM Israël-Science and Technology LTD, la société de services informatiques portugaise Feedzai, le Centre National de la recherche Scientifique (CNRS) en France, l'école Suisse ETH de Zurich, Technion-Israel et l'Université de Birmingham. Ces équipes ont travaillé sur le développement des modules de traitement d'évènements complexes, de prise de décision proactive et de visualisation pour assister les opérateurs et les décideurs dans les tâches difficiles de prédiction d'évènements et de prise de décision corrective. Ces tâches sont de réels défis à l'ère des données massives où le nombre d'évènements s'évalue de la dizaine de milliers à des dizaines de millions par seconde.

« Le volume, la variété et les incertitudes des flux de données massives sont autant un challenge et une opportunité » disait George Paliouras, le coordinateur de SPEEDD. « La prise de décision proactive basée sur les évènements est rendue possible par la combinaison des technologies innovantes issues des disciplines suivantes : le traitement d'évènements complexes, l'automatique, et l'interaction homme-machine. C'est le potentiel issu de cette combinaison qui fait de SPEEDD une initiative passionnante.

SPEEDD a atteint un certain nombre de jalons durant cette année. Premièrement, pour mieux cerner les besoins des opérateurs de trafic et de banque, l'équipe a conduit des études de terrain au centre de contrôle du trafic de la DIR-CE à Grenoble (France), et a consulté des experts de Feedzai et de certaines banque pour faire le point sur les pratiques usuelles dans la gestion des fraudes à la carte bancaire. Deuxièmement, via l'utilisation des plateformes open-source telles que STORM et KAFKA, le module de traitement d'évènements

FIGURE 15: 2ND SPEEDD PRESS RELEASE IN FRENCH (JUNE 2016)

Press Release in German

Ist es möglich, Verkehrsstaus vorherzusagen - und bereits vor ihrer Enstehung zu verhindern? Und ist es möglich, Kreditkartenbetrug bereits zu erkennen, bevor die Transaktion autorisiert wird? Dies sind nur einige der schwierigen Fragen, welche im Rahmen des europäischen Forschungsprojekts SPEEDD beantwortet werden.

In den ersten zwei Jahren hat SPEEDD führende universitäre und industrielle Partner zusammengebracht, um neue Technologien zur Vorhersage komplexer Ereignisse (Complex Event Processing, CEP) zu entwickeln. SPEEDD ist ein Gemeinschaftsprojekt an welchem das Nationale Griechische Forschungszentrum "Demokritos" (Projektkoordinator), IBM Israel – Science and Technology LTD, das portugiesische IT-Startup Feedzai, das Nationale Französische Forschungszentrum "CNRS", Technion – Isreal Institute of Technology, die ETH Zürich und die University of Birmingham als Projektpartner beteiligt sind. Im Rahmen von SPEEDD werden modernste CEP-Tools einschliesslich vorausschauender Entscheidungs- und Regelungsmodule und innovativer Visualisierungslösungen entwickelt. In der heutigen "Big Data"-Ära sind diese Aufgaben besonders herausfordernd, da derartige Systeme bis zu mehrere Millionen Ereignissen pro Sekunde verarbeiten müssen.

"Der Umfang, die Vielfalt und die Unsicherheit von Big-Data Streams sind eine enorme Herausforderung, aber auch gleichzeitig eine einmalige Gelegenheit für innovative Lösungen", sagt George Paliouras, Koordinator von SPEEDD. "Ereignisgesteuerte, vorausschauende Entscheidungsfindung für Big-Data verlangt das Zusammenspiel von Complex Event Processing, klassischer Regelungstechnik und einer auf den Menschen zugeschnittenen Benutzerschnittstelle. Die Kombination dieser Technologien verspricht grosses Potential, welches SPEEDD zu einem solch spannendem Unterfangen macht!"

Auf dem Weg zu diesem Ziel wurden im Rahmen von SPEEDD bereits entscheidende Meilensteine erreicht. Um die spezifischen Anforderungen der Endbenutzer in den beiden Anwendungsfallstudien zu verstehen,

FIGURE 16: 2ND SPEEDD PRESS RELEASE IN GERMAN (JUNE 2016)

Press Release in Hebrew

האם ניתן לצפות פקקי תנועה ולמנוע אותם? מה לגבי איתור מהיר של הונאה בכרטיסי אשראי? עד כמה מהר זה יכול להיעשות?

אלו הן רק חלק מהשאלות הקשות עליהן מנסה לענות פרוייקט מחקר אירופאי בשם SPEEDD, המפגיש חוקרים מובילים מהאקדמיה ומהתעשייה, במטרה לפתח טכנולוגיה שתאפשר לצפות אירועים משמעותיים מראש ולהגיב אליהם בצורה אוטומטית.

בפרוייקט, שזה עתה הסתיימה שנתו השנייה, נוטלים חלק צוותים מהמרכז הלאומי היווני למחקר מדעי "Demokritos" (מתאם הפרוייקט), מעבדת המחקר של יבמ ישראל - מדע וטכנולוגיה בע"מ, חברת Π מפורטוגל - Feedzai, המרכז הלאומי הצרפתי למחקר מדעי "CNRS", הטכניון - מכון טכנולוגי לישראל, המכון השוויצרי הפדרלי לטכנולוגיה HT ואוניברסיטת בירמינגהם. צוותים אלה עבדו בשנתיים האחרונות על פיתוח מודלים פרו-אקטיביים חדשניים לקבלת החלטות, עיבוד ארועים בנפחים גדולים וכלים להדמיה, על מנת לסייע לארגונים להתמודד עם המשימה של חיזוי אירועים וקבלת החלטות. משימה זו מאתגרת במיוחד בעידן של Big Data, בו שיעור האירועים הנכנסים למערכות נע בין עשרות אלפים למיליוני אירועים בעיה.

"ההיקף, המגוון וחוסר הוודאות של זרמי נתונים גדולים, מהווים בו זמנית אתגר והזדמנות", אומר ג'ורג' פליאורס, מתאם SPEEDD. "קבלת החלטות פרו-אקטיבית מבוססת אירועים מתאפשרת על ידי השילוב של טכנולוגיות חדשניות מתחומי עיבוד נתוני אירועים מורכבים, תורת הבקרה ואינטראקציית אדם-מחשב. הפוטנציאל של שילוב זה הוא שהופך את SPEEDD לפרוייקט כה מרגש!"

כדי להשיג את מטרות הפרוייקט, עבר SPEEDD מספר ציוני דרך. ראשית, כדי להבין טוב יותר את הצרכים של מפעילי תנועה בוצעו מחקרי שדה משותפים עם צוות חדר בקרה במרכז לבקרת התנועה DIR-CE בגרנובל, צרפת. במקביל, כדי להבין את צרכי המפעילים בבנקים, התייעץ הצוות עם אנשי בנקים ועם מומחי Feedzai על-מנת לפתח תובנות לגבי שיטות לניהול מקרי הונאה נפוצים. בשלב שני, באמצעות שימוש בפלטפורמות המובילות (בקוד פתוח) להזרמת נתונים שיטות לניהול מקרי הונאה נפוצים. בשלב שני, באמצעות שימוש בפלטפורמות המובילות (בקוד פתוח) להזרמת נתונים שיטות לניהול מקרי הונאה נפוצים. בשלב שני, באמצעות שימוש בפלטפורמות המובילות (בקוד פתוח) להזרמת נתונים החלטות המיושמים על ידי ETH ופלטפורמת הניתוח החזותי שפותחה על ידי אוניברסיטת בירמינגהם. בשלב השלישי, על מנת לספק חוקים לעיבוד אירועים ל- PROTON בשפה "אנושית מובנת", פיתחו אנשי NCSR Demokrito על מנת לספק חוקים לעיבוד אירועים ל- PROTON בשפה "אנושית מובנת", פיתחו אנשי NCSR Demokrito אלגוריתמים מתקדמים ללמידת מכונה. בשלב הרביעי, פיתח הטכניון אלגוריתמים מבוזרים מתקדמים לניטור הסטייה של מודל גלובלי לעבר מצבים חריגים. כמו כן, הצליח צוות הפרוייקט "לסגור מעגל" ולהעריך את איכות קבלת המחלטות בנהול תנועת רכבים, על ידי שילוב מיקרו-סימולטור לתנועת רכבים שפותח על ידי CNRS, המבוסס על המוצר המסחרי AIMSUN.

FIGURE 17: 2ND SPEEDD PRESS RELEASE IN HEBREW (JUNE 2016)



Press Palaass in Portuguese
Fress Release in Fortuguese
Será possível prever congestionamento de trânsito e prevení-lo? E quanto à detecção de fraude em cartões de crédito? O quão rápido pode ser feita? Estas são algumas das questões importantes que o projecto de investigação Europeu SPEEDD pretende responder.
Durante os dois primeiros anos, SPEEDD juntou líders da Academia e da Indústria para desenvolver uma tecnologia capaz de prever e responder de forma automática a eventos. SPEEDD é um esforço colaborativo entre o Centro Nacional Grego para Investigação Científica "Demokitros" (coordenador), IBM Israel - Ciência e Tecnologia LTD, a companhia portuguesa de IT Feedzai, o Centro Nacional Francês para Investigação Científica "CNRS", Technion - Instituto Israelita para Tecnologia, o Instituto Federal Suiço de Tecnologia "ETH" e a Universidade de Birmingham. Estas equipas trabalharam em componentes do estado-da-arte na área de processamento de eventos, módulos de decisão proactiva e ferramentas inovadoras de visualização para auxiliar operadores e organizações com tarefas exigentes de previsão de eventos e processos de decisão correctivos. Estas tarefas são especialmente desafiantes no tempo da Big Data, onde o ritmo de chegada de eventos pode variar entre as dezenas de milhares a milhões de eventos por segundo.
"O volume, variedade e incerteza dos fluxos de Big Data são tanto um desafio como uma oportunidade." disse George Paliouras, o coordenador do projecto SPEEDD. "Processos de decisão proactivos orientados a eventos são possíveis devido à combinação de tecnologias inovadoras das áreas de processamento de eventos complexos, controlo e interacção humano-computador. É o potencial desta combinação que faz do SPEEDD um esforço tão emocionante!"
Para alcançar tais objectivos, o SPEEDD cumpriu várias metas. Primeiro, para perceber melhor as necessidades de tráfego e operadores bancários, a equipa conduziu estudos de campo com pessoal de controlo no centro de tráfego DIR-CE situado em Grenoble, França, e consultou empregados de bancos e especialistas da Feedzai para juntar conhecimento sobre as práticas mais comuns em detecção de fraude. Em segundo lugar, através do uso de código open-source mais recente em áreas de fluxo e plataformas de mensagens (STORM, KAFKA), o processador de eventos da IBM PROTON foi integrado com algoritmos de decisão implementados pelo ETH e a plataform de análise visual da Universidade de Birmingham. Em terceiro, algoritmos avançados de machine learning foram desenvolvidos pelo NCSR "Demokritos" para fornecer regras legíveis por humanos para o processador PROTON. Em quarto lugar, o Technion desenvolveu algoritmos distribuídos para monitorizar o desvio de um modelo global, apoiado em estados anómalos. Por

FIGURE 18: 2ND SPEEDD PRESS RELEASE IN PORTUGUESE (JUNE 2016)

Additionally, the press release was digitally disseminated to various international media and featured as a news item on the European Commission's CORDIS online platform (Figure 19) (http://cordis.europa.eu/news/rcn/136635_en.html).



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Europea Commis	n sion	Community Resea	arch and Developme	ent Information	Service	
n Commiss h project SI	ion > CORDIS PEEDD	> News and Events > Intelliger	nt predictive and proactive teo	chnology produced by I	European	
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ntollia	ent nred	ictive and proactiv	e technology pro	duced by Fu	ropean Rese	earch
ontributed	SPEEDD	Coordinator: NCSR "DEMOKR	TIOS"			
ontributed an we pre	SPEEDD by: Project (edict and avoi t questions th	Coordinator: NCSR "DEMOKR id traffic jams? What about t hat the European project "SP	ITOS" the use of stolen credit ca PEEDD" is called upon to r	urds? How quickly c espond to.	an we do it? Thes	e are just some of
ontributed an we pre- be difficult esearchers ystems an inovative v precasting	SPEEDD by: Project C dict and avoid t questions the s working on t d algorithms for visualisation to thus helping t	Coordinator: NCSR "DEMOKR id traffic jams? What about it hat the European project "SP the SPEEDD project design and or rapid and proactive decision pols to help users and organis them take appropriate proactive	ITOS" the use of stolen credit ca <i>FEEDD" is called upon to i</i> d implement innovative even- naking. Additionally, they ations on the demanding to ve decisions.	ords? How quickly c espond to. ent analysis have created ask of event	an we do it? Thes	e are just some of

2.6 SPEEDD SHOWCASE VIDEOSAND DEMOS

As results from the SPEEDD project matured, partner IBM has produced two promotional videos presenting the tools that were developed during the SPEEDD project. The videos deliver an explanation of tool development and usage as well as scientific advances achieved during the project. The videos are available under the showcase page on the SPEEDD website, distributed on social media channels and disseminated via partner's social media and webpages on the project website here: http://speeddproject.eu/content/showcase-videos

Additionally, a demonstration of the SPEEDD software for the fraud use case (*Fraud Analysis Dashboard*) is available in the use case section of the project Web site (<u>http://speedd-project.eu/project/usecases</u>). The demo has also been submitted for presentation at the DEBS17 conference.

2.7 RELEASED SOFTWARE

In addition to the software releases that constitute formal project deliverables, the SPEEDD consortium has released a number of software components and/or intermediate releases as open-source to the wider public. These include the SPEEDD complex event processing/recognition engines (Proton, developed by IBM Research – Haifa and RTEC developed by NCSR-D). The SPEEDD project produced software, which was announced on the project website see Figure 20: http://speedd-project.eu/CONTENT/SOFTWARE.

In addition, the source code and installation archives are available at major open-source project repositories such as GitHub.

SPEEDD integrated prototype - https://github.com/speedd-project/speedd



RTEC Event Calculus for Run-Time reasoning - http://cer.iit.demokritos.gr/RTEC/

ILED Learning event definitions with Inductive Logic Programming - http://cer.iit.demokritos.gr/ILED/

	SP	EEDD	Scalable Proact Decision-making	ive Eve)	ent-Driven				Search th	Is site	٩
Home	The project 🔻	Meet the SPEEDD peop	le Scientific Results •	Data	Deliverables •	Related Work	News	Contact	Forums	Login	
Home » Scie	ientific Results										
EEDD integ	grated prototype. Calculus for Run-T	ime reasoning									
D Learning	g event definitions	with Inductive Logic Progra	Imming								
			Follo	w us: twitter	linkedin PEEDD project						
			Copyright	e 2010, ale 51							

Figure 20: SOFTWARE PRODUCED DURING THE PROJECT FEATURING ON THE SPEEDD WEBSITE

NCSR-D and SciFY (SciFY is subcontracted by NCSR-D for dissemination purposes) have been collaborating in order to create a roadmap for the dissemination of open source software tools produced and used within SPEEDD. The Complex Event Processing tools RTEC and ILED have been used as case studies in this dissemination process.

Specifically, the collaboration between NCSR-D and SciFY within SPEEDD had two main objectives:

- to communicate efficiently the value of the software tools,
- to facilitate the communication of the project findings to relevant social media and minimize the related overhead for multi-channel communication.

To achieve the first goal a focus group was created to discuss the workflow of each tool, and ran two iterations of development for the tool websites. The websites were broken down into a landing page, a demo workflow page and a contact information page. The landing page aims to communicate the basic information and overview how one can take advantage of the tool in real-life applications. The demo workflow illustrates the system analysis steps on existing data, to better acquaint potential adopters with the use of the system. The contact information page allows direct expression of interest. The tool websites followed a unified appearance (theme) and the design is meant to provide information in an efficient, friendly manner.

To achieve the second goal, an automated tool was built that reads a specific news feed (in RSS form) and posts the updates to appropriate social media accounts. For the purposes of the project, the tool supported a LinkedIn and a Twitter account. The tool uses the corresponding service APIs, thus being extensible with more tools in the future. Overall, the combination of the websites and the automated tool forms a powerful toolset allowing the dissemination of related results.

2.8 EVENTS



In 2014, SPEEDD partners organised a workshop, under the title *"Event Processing, Forecasting and Decision-Making in the Big Data Era"*, as part of the EDBT/ICDT 2015 Joint Conference. This workshop presented some of the results from the work done in the SPEEDD project and was organised in collaboration with the FERARI and PROASENSE projects.

In addition to organising the SPEEDD workshop, the academic partners have participated in a great variety of events with presentations and invited talks in conferences, and workshops as shown in Table 1 below.

EVENTS -TALKS - PAPERS - MEETINGS							
ACTIVITY UNDERTAKEN / EVENT TITLE	DATE	LOCATION	Website URL	ACTIVITY TYPE	SPEAKER (Partner organisation)	AUDIENCES	ATTENDE ES (number)
Hellenic Innovation Forum 17 (HIF17) (projected)	24-25 February 2017	Athens, GR	http://hif.et hosevents.e u/homepage L	Presenta tion	G. Paliouras (NCSR-D)	ТВА	ТВА
2016 Stream Reasoning Workshop	8-9 December 2016	Berlin, DE	http://www. ods.tu- berlin.de/m enue/fachge biet open d istributed s ystems/stre am reasoni ng worksho p_2016 berl in 8th to 9 th_decembe r 2016/prog ram and sc hedule/	Presenta tion	-	-	-
ICLP 2016 - 32 nd International Conference on Logic Programming	16-21 October 2016	New York City, USA	http://softw are.imdea.or g/Conferenc es/ICLP2016 /index.html	Paper Presenta tion	-	-	-
ECML-PKDD 2016	19-23 September 2016	Riva del Garda, Italy	<u>http://www.</u> <u>ecmlpkdd20</u> <u>16.org/</u>	Presenta tion	E. Michelioudakis (NCSR-D)	-	-
37th International Summer School of Automatic Control	12-16 September 2016	Grenoble, FR	<u>http://www.</u> gipsa- lab.fr/summ erschool/aut o2016/	Lectures	A. Kibangou (CNRS), C. Canudas de Wit(CNRS)	Internation al researcher s and PhD students	50
ILP 2016 - Conference on Inductive Logic Programming	4-6 September 2016	London, UK	<u>http://ilp16.</u> <u>doc.ic.ac.uk/</u>	Presenta tion	E. Michelioudakis (NCSR-D)	-	-
ECAI 2016 - Complex Event Recognition	19 Aug - 2 September 2016	The Hague, NL	http://www. ecai2016.org /program/tu torials/#t1	Tutorial	A. Artikis(NCSR-D)	-	-
Dagstuhl Seminar - Integrating Process- Oriented and Event- Based Systems	21-26 August 2016	Wadern, Germany	http://www. dagstuhl.de/ no cache/e n/program/c alendar/sem hp/?semnr= 16341	Presenta tion	A. Artikis(NCSR-D)	-	-
European Control Conference 2016 (ECC16)	29 June-1 July 2016	Aalborg, DK	http://www. ecc16.eu/in dex.shtml	Presenta tion	A. Ladino Lopez (CNRS)	-	-

Table 1: Event participation



2.9 COLLABORATIONS

During the three years of the project, the relations among the partners of the project have been strengthened and have led to further collaborations. The organisation of the workshop as well as partner participation to the various events outlined in this document have provided partners with the opportunity to meet researchers, institutions and companies of the domain so as to lay the foundations for possible future collaborations.

Furthermore, a workshop was co-organised between the SPEEDD project, FERARI and PROASENSE projects. Additionally, SPEEDD partners have sought to establish collaboration with the Cosmos Project (http://cosmosproject.org/) and arranged a (Skype) meeting with its coordinator.

2.10 TEACHING

An important aspect of disseminating expertise and knowledge gained throughout the project is through the curricula of students studying at the academic institutions participating in the project (ETH, the University of Birmingham and the Technion). Although these activities are not part of the project directly, they are important for disseminating best practice and knowledge, as well as for preparing students to work with relevant innovative technologies. The topics of the project have influenced some of the lectures, seminars and practical work, which were held at academic partners' institutions.

Most importantly, however, a number of PhD students were trained in the context of the project and contributed significantly in its research results. This was the case not only for the three universities (ETH, the University of Birmingham and the Technion), but also for the two research centers involved in the project (NCSR-D and CNRS).

Furthermore, SPEEDD partners have released teaching material, which have been used during summer schools as well as presentations and videos on platforms such as SlideShare, SlideWiki and Videolectures. This material is available here: http://cer.iit.demokritos.gr/

2.11 SOCIAL MEDIA AND ONLINE DISSEMINATION

The dissemination of SPEEDD project results has been materialised through several channels. Besides the project website the opportunities offered by social media platforms, such as LinkedIn and Twitter have also been exploited.

2.11.1 SOCIAL MEDIA CHANNELS

The project's LinkedIn account has 20 members (Figure 21).



20 members		√ Pending
Speedd project	Alexander Artikis Assistant Professor at University of Pira	ABOUT THIS GROUP This group discussed topics related to the SPEEDD EU project. SPEEDD will develop a prototype for robust forecasting and proactive decision-making, in the sense that it will be resilient to the inherent uncertainty of Big
Data Scientist / Data Engineer at Pollfish	Alexander Artikis	Data, which include incomple Show more

FIGURE 21: LINKEDIN SPEEDD HOMEPAGE

The project's Twitter account has thirty-four tweets and eight followers (Figure 22).



FIGURE 22: TWITTER SPEEDD HOMEPAGE



2.11.2 ONLINE DISSEMINATION

PUBLICITY - SOCIAL MEDIA - WEBSITES - BLOGS etc.						
WHAT	WHERE	DATES	Website URL	FACEBOOK	TWITTER	
Announcing Event Processing workshop	Official SPEEDD Twitter account	5.3.2015	-	-	https://twitter.com/speedd_p roject/status/5734398026259 53792	
Announcing new publications appearance	Official SPEEDD Twitter account	5.3.2015	-	-	https://twitter.com/speedd_p roject/status/5734398038716 45696	
Prompt to join workshop, EDBT 2015	Official SPEEDD Twitter account	5.3.2015	-	-	https://twitter.com/speedd_p roject/status/5734398048908 08320	
Announcing publication appearance in IEEE TKDE	Official SPEEDD Twitter account	5.3.2015	-	-	https://twitter.com/speedd_p roject/status/5734398057884 38528	
EDBT 2015 workshop program	Official SPEEDD Twitter account	5.3.2015	-	-	https://twitter.com/speedd_p roject/status/5734398067782 81984	
Visual Analytics new papers	Official SPEEDD Twitter account	6.3.2015	-	-	https://twitter.com/speedd_p roject/status/5738746590468 66944	
New publication in DEBS 15	Official SPEEDD Twitter account	19.5.2015	-	-	https://twitter.com/speedd_p roject/status/6006772270518 06720	
Two new publications in KDD15 & ECC15	Official SPEEDD Twitter account	10.6.2015	-	-	https://twitter.com/speedd_p roject/status/6086498317379 13345	
Best research paper award in DEBS 2015	Official SPEEDD Twitter account	30.7.2015	-	-	https://twitter.com/speedd_p roject/status/6267691399909 49888	
Best conference paper award in EHF 2015	Official SPEEDD Twitter account	1.9.2015	-	-	https://twitter.com/speedd_p roject/status/6387277942692 86400	
New publication in HFES 2015	Official SPEEDD Twitter account	20.1.2016	-	-	https://twitter.com/speedd_p roject/status/6898397943487 52896	
New papers in CDC 2015	Official SPEEDD Twitter account	18.2.2016	-	-	https://twitter.com/speedd_p roject/status/7003490651465 31842	
Call for Papers for Special Issue	Official SPEEDD Twitter account	24.2.2016	-	-	https://twitter.com/speedd_p roject/status/7025234243636 83840	
Tutorial at ECAI 2016	Official SPEEDD Twitter account	4.3.2016	-	-	https://twitter.com/speedd_p roject/status/7057849014009 89696	
Second Call for Papers for Special Issue	Official SPEEDD Twitter account	18.4.2016	-	-	https://twitter.com/speedd_p roject/status/7220772571000 95488	
SPEEDD project meeting	Official SPEEDD Twitter account	31.5.2016	-	-	https://twitter.com/speedd_p roject/status/7375757834728 89857	
SPEEDD Plenary Meeting	SKEL Lab, NCSR-D, Social Media	31.5.2016- 2.6.2016	-	https://www.facebook.co m/skel.demokritos/posts /969560139806049	https://twitter.com/iit_demo kritos/status/7376318283460 15744 https://twitter.com/iit_demo kritos/status/7377346373724 85633	

SPEEDD Press Release (EN+GR)	SPEEDD website	6.6.2016	http://speedd- project.eu/news/press- release-intelligent-predictive- and-proactive-technology- european-research-project- speedd	-	-
SPEEDD Press Release (GR)	IIT website	6.6.2016	https://www.iit.demokritos.gr /news/Press-release-speedd	https://www.facebook.co m/skel.demokritos/posts /971600726268657 http://www.demokritos.g r/Contents.aspx?lang=gr &CatId=1808&View=18	https://twitter.com/iit_demo kritos/status/7401117711056 97792
SPEEDD Press Release (GR)	Matrix24 portal	7.6.2016	http://www.matrix24.gr/2016 /06/evropaiko-ergogia-tin- apofigi-botiliarismatos-stin- poli/	-	https://twitter.com/iit_demo kritos/status/7376318283460 15744
SPEEDD Press Release (GR)	NCSR "Demokritos" central website	6.6.2016	http://www.demokritos.gr/Co ntents.aspx?lang=gr&CatId=18 08&View=18	https://www.facebook.co m/skel.demokritos/photo s/a.741002772661788.10 73741827.740979065997 492/972259489536114/? type=3&theater	https://twitter.com/iit_demo kritos/status/7405189643469 12769
SPEEDD Press Release (GR)	DIKAIOLOGITIKA.GR	7.6.2016	http://www.dikaiologitika.gr/e idhseis/dhmosio/110230/efar mogi-gia-tin-apofygi-tis-kinisis- apo-ton-dimokrito	-	-
SPEEDD Press Release (GR)	ICTPLUS.GR	7.6.2016	http://www.ictplus.gr/default. asp?pid=30&rID=44440&ct=14 &la=1	-	-
SPEEDD News item (GR)	iNewsgr portal	7.6.2016	http://www.inewsgr.com/253 /evropaiko-ergo-gia-tin- apofygi-botiliarismatos-stin- poli.htm	-	-
SPEEDD Press Release (GR)	Spark News	7.6.2016	http://www.sparknews.gr/%C E%BF- %CE%B4%CE%B7%CE%BC%CF %8C%CE%BA%CF%81%CE%BC %CF%84%CE%BF%CF%81%CE%B2 %CF%83%CF%85%CE%BA%CF %84%CE%BF%CE%B5%CE%B4 %CF%85%CF%85%CF%81%CF %89%CF%80%CE%85%CF%81%CF	-	-
SPEEDD Press Release (GR)	News123.gr	7.6.2016	news123.gr/evropaiko-ergo- gia-tin-apofigi- mpotiliarismatos-stin-poli/		
New publication in ECML-PKDD 2016	Official SPEEDD Twitter account	22.6.2016	-	-	https://twitter.com/speedd_p roject/status/7456324743325 <u>32736</u>
RT: Press Release on project progress	Official SPEEDD Twitter account	29.6.2016	-	-	https://twitter.com/iit_demo kritos/status/7481372172063 <u>98976</u>
Press Release on project progress	Official SPEEDD Twitter account	29.6.2016	-	-	https://twitter.com/speedd_p roject/status/7481692123765 <u>18656</u>
Paper in ECML 2016	Official SPEEDD Twitter account	22.7.2016	-	-	https://twitter.com/speedd_p roject/status/7565040887795 <u>54817</u>
Paper in ICLP 2016	Official SPEEDD Twitter account	22.7.2016	-	-	https://twitter.com/speedd_p roject/status/7565040912207 <u>38049</u>
Participation in Dagstuhl Seminar	Official SPEEDD Twitter account	22.7.2016	-	-	https://twitter.com/speedd_p roject/status/7565040923951 14496
Blog Post on IBM Website	IBM website	2.8.2016	https://www.ibm.com/blogs/r esearch/2016/08/what-if-you- knew-a-traffic-jam-was-about- to-happen/		

Blog Post on IBM Website	SKEL Lab, NCSR-D, Social Media	16.8.2016		https://www.facebook.co m/skel.demokritos/photo g/a.741002772661788.10 73741827.740979065997 492/1017225935039469/ ?type=3&theater	
Announcing blog post on IBM website	SKEL Lab, NCSR-D website	6.9.2016	https://www.iit.demokritos.gr /el/news/speedd-skel- website-ibm-research		
SPEEDD News item	CORDIS NEWS SECTION	28.11.2016	http://cordis.europa.eu/news/ rcn/136635_en.html	https://www.facebook.co m/skel.demokritos/photo s/a.741002772661788.10 73741827.740979065997 492/1112388502189878/ <u>?type=3&theater</u>	https://twitter.com/iit_demo kritos/status/8039177730470 09280
Participation in 2016 Stream Reasoning Workshop	Official SPEEDD Twitter account	6.12.2016	-	-	https://twitter.com/speedd_p roject/status/8061663537281 18785
New publication in ILP 2016	Official SPEEDD Twitter account	9.1.2017	-	-	https://twitter.com/speedd_p roject/status/8184875511536 02561
SPEEDD publicized on CORDIS website	Official SPEEDD Twitter account	14.1.2017	-	-	https://twitter.com/speedd_p roject/status/8202994787542 13888
IBM Research website blog post	Official SPEEDD Twitter account	17.1.2017	-	-	https://twitter.com/speedd_p roject/status/8213866822683 48417
Announcement of two new SPEEDD videos on Traffic Management and Card Fraud	Official SPEEDD website	15.2.2017	http://www.spee dd- project.eu/conten t/showcase- videos	-	https://twitter.com/speedd_p roject/status/8319036759331 96289
Announcement of new SPEEDD video on Card Fraud	Official SPEEDD Twitter account	16.2.2017	http://www.spee dd- project.eu/conten t/showcase- videos	-	https://twitter.com/speedd_p roject/status/8322384706681 15972
Announcement of new SPEEDD video on Traffic Management	Official SPEEDD Twitter account	16.2.2017	http://www.spee dd- project.eu/conten t/showcase- videos	-	https://mobile.twitter.com/sp eedd_project/status/8319036 75933196289

2.12 SCIENTIFIC PUBLICATIONS

In the course of the SPEEDD project partners wrote, published and presented scientific advances achieved within the project in technical papers as well as in journals (peer reviewed or not) and magazines. The following lists provide an overview of the number of publications/presentations per type while the full detailed list can be found further along in this document.

One of the highlights of the SPEEDD publications were the awards received in two occasions.

SPEEDD partner, **University of Birmingham**, won **Best Conference Paper Award** at the International Conference on Ergonomics & Human Factors 2015 (EHF 2015) for their paper *"Visual Sampling in a Road Traffic Management Control Room Task"*. Their work featured in the Ergonomist.

Additionally, partner **Technion Israel Institute of Technology** won the **Award for Best Research Paper** at the 9th ACM International Conference on Distributed Event-Based Systems (**DEBS 2015**) for their paper *"Lazy Evaluation Methods for Detecting Complex Events"*.



SPEEDD consortium partners have targeted and participated in specific scientific and industrial conferences and journals, as presented in the following list.

2.12.1 LIST OF JOURNAL PUBLICATIONS

- A. Kibangou, A. Artikis, E. Michelioudakis, G. Paliouras, M. Schmitt, J. Lygeros, C. Baber, N. Morar, F. Fabiana, and I. Skarbovsky
 An integrated and scalable platform for proactive event-driven traffic management
 Submitted to ACM Transactions on Intelligent Systems Technology
- A. Ladino Lopez, A. Kibangou, H. Fourati, and C. Canudas de Wit *A real time forecasting tool for dynamic travel time from clustered time series* **Submitted** to Transportation research Part C
- S. Grammatico, X. Zhang, K. Margellos, P. Goulart, and J. Lygeros
 <u>A Scenario Approach for Non-Convex Control Design</u>
 IEEE Transactions on Automatic Control, vol. 61, no. 2, pp. 334 345, February 2016
- 4. K. Margellos, M. Prandini, and J. Lygeros <u>On the Connection Between Compression Learning and Scenario Based Single-Stage and Cascading</u> <u>Optimization Problems</u>
- IEEE Transactions on Automatic Control, vol. 60, no. 10, pp. 2716 2721, October 2015
 X. Zhang, S. Grammatico, G. Schildbach, P.J. Goulart, and J. Lygeros
 On the Sample Size of Random Convex Programs with Structured Dependence on the Uncertainty
 Automatica, vol. 60, pp. 182-188, October 2015.
- Morar, N., Baber, C., Starke, S. and Fournier, F. <u>Missing Key Information: How Automation Failure can be Misinterpreted.</u> Human Factors and Ergonomics Society Annual Meeting, Vol. 59, No. 1, pp. 200-204, September 2015.
- Katzouris N., Artikis A., Paliouras G. <u>Incremental Learning of Event Definitions with Inductive Logic Programming</u> Machine Learning Journal, vol. 100, pp. 555-585, September 2015
- S. Starke, C. Baber, N. Cooke, A. Howes and NatanMorar <u>Making sense of complex environments</u> The Ergonomist, No. 539, May 2015
- Skarlatidis A., Paliouras G., Artikis A. and Vouros G. <u>Probabilistic Event Calculus for Event Recognition</u> ACM Transactions on Computational Logic, vol. 16, pp. 1-37, March 2015.
- 10. Artikis A., Sergot M. and Paliouras G.
 <u>An Event Calculus for Event Recognition</u>

IEEE Transactions on Knowledge and Data Engineering (TKDE), vol. 27, pp. 895-908, September 2014

 Artikis A., Baber C., Bizarro P., Canudas-de-Wit C., Etzion O., Fournier F., Goulart P., Howes A., Lygeros J., Paliouras G., Schuster A. and Sharfman I. <u>Scalable Proactive Event-Driven Decision-Making</u> IEEE Technology & Society Magazine, vol. 33, pp. 35-41, September 2014.

 Artikis A., Gal A., Kalogeraki V., Weidlich M. <u>Event Recognition Challenges and Techniques: Guest Editors' Introduction</u> ACM Transactions on Internet Technology, vol. 14, pp. 1-9, July 2014.



2.12.2 LIST OF CONFERENCE PUBLICATIONS

- Michelioudakis, E., Artikis, A., Paliouras, G. Online Structure Learning for Traffic Management International Conference on Inductive Logic Programming, London, England, September 2016.
- Michelioudakis, E., Skarlatidis, A., Paliouras, G., Artikis, A. <u>OSLa: Online Structure Learning using Background Knowledge Axiomatization</u> European Conference of Machine Learning and Principles and Practice of Knowledge Discovery, pp. 232-247, Riva del Garda, Italy, September 2016.
- A. Ladino, A. Kibangou, H. Fourati, C. Canudas de Wit <u>Travel time forecasting from clustered time series via optimal fusion strategy</u> European Control Conference, pp. 2234-2239, Aalborg, Denmark, June 2016.
- Chithrupa Ramesh, Marius Schmitt and John Lygeros <u>Distributed Learning in the Presence of Disturbances</u> European Control Conference, pp. 257-262, Aalborg, Denmark, June 2016.
- Starke, S. and Baber, C. <u>The computer-human duet: interaction with a gaze-based recommender system when making</u> <u>decisions based on multiple information sources</u> Human Factors in Complex Systems, Nottingham, UK, June 2016.
- A.B. Hempel, P.J. Goulart and J. Lygeros
 <u>A necessary optimality condition for constrained optimal control of hybrid systems</u>
 IEEE 54th Annual Conference on Decision and Control (CDC), pp. 5272 - 5277, Osaka, Japan,
 December 2015
- Enrico Lovisari, Carlos Canudas de Wit and Alain Y. Kibangou <u>Optimal Sensor Placement in Road Transportation Networks using Virtual Variances.</u> 54th IEEE Conference on Decision and Control, Osaka, Japan, December 2015
- Enrico Lovisari, Carlos Canudas de Wit and Alain Y. Kibangou <u>Data fusion algorithms for Density Reconstruction in Road Transportation Networks.</u> 54th IEEE Conference on Decision and Control, Osaka, Japan, December 2015.
- P. Grandinetti, F. Garin, C. Canudas de Wit. <u>Towards scalable optimal traffic control</u> 54th IEEE Conference on Decision and Control, Osaka, Japan, December 2015
- Gabel, Moshe and Keren, Daniel and Schuster, Assaf <u>Monitoring Least Squares Models of Distributed Streams</u> 21st ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Sydney, NSW, Australia, August, 2015
- Marius Schmitt, Paul Goulart, Angelos Georghiou and John Lygeros <u>Flow-maximizing equilibria of the Cell Transmission Model</u> European Control Conference, pp. 2634-2639, Linz, Austria, July 2015.
- I. Kolchinsky, T. Sharfman, A. Schuster
 <u>Lazy Evaluation Methods for Detecting Complex Events</u>
 The 9th ACM International Conference on Distributed Event-Based Systems (DEBS). Oslo, July 2015

 Best research paper award!
- Grandinetti, P. and Canudas de Wit, C. and Garin, F. <u>An efficient one step ahead optimal control for urban signalized traffic networks based on an</u> <u>averaged Cell Transmission Model</u> 14th IEEE European Control Conference (ECC), Linz, Austria, July 2015
- Correia, I., Fournier, F., & Skarbovsky, I. <u>Industry Paper: The Uncertain Case of Credit Card Fraud Detection</u> The 9th ACM International Conference on Distributed Event-Based Systems (DEBS), Oslo, Norway, June 2015



 S. Starke, N. Cooke, A. Howes, N. Morarm and C. Baber <u>Visual Sampling in a Road Traffic Management Control Room Task</u> International Conference on Ergonomics & Human Factors 2015, Daventry, Northamptonshire, UK, 13-16, April 2015

Best conference paper award!

- Chen, X., Bailly, G., Brumby, D. P., Oulasvirta, A. &Howes, A. <u>The Emergence of Interactive Behaviour: A model of Rational Menu Search</u> 33nd annual ACM conference on Human factors in computing systems (CHI), Seoul, Republic of Korea, April, 2015
- Sandra D. Starke, Neil Cooke, Andrew Howes, Natan S. Morar& Chris Baber <u>Visual sampling in a road traffic management control room task</u> Contemporary Ergonomics 2015 CRC Press
- Gabel M., Sato K., Keren D. Matsuoka S. and Schuster A. <u>Latent Fault Detection With Unbalanced Workloads</u> Event Processing, Forecasting and Decision-Making in the Big Data Era (EPForDM), EDBT 2015 Workshop.
- Fournier F., Kofman A., Skarbovsky I. and Skarlatidis A. <u>Extending Event-Driven Architecture for Proactive Systems</u> Event Processing, Forecasting and Decision-Making in the Big Data Era (EPForDM), EDBT 2015 Workshop.
- Alevizos E., Skarlatidis A., Artikis A. and Paliouras G. <u>Complex Event Recognition under Uncertainty: A Short Survey</u> Event Processing, Forecasting and Decision-Making in the Big Data Era (EPForDM), EDBT 2015 Workshop.
- Alevizos E. and Artikis A.
 <u>Being logical or going with the flow? A comparison of Complex Event Processing systems</u> 8th Hellenic Conference on Artificial Intelligence, pp. 460-474, 2014.

