Designing the Future
(begins with understanding the past)

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SOLVAY CONFERENCE 1927

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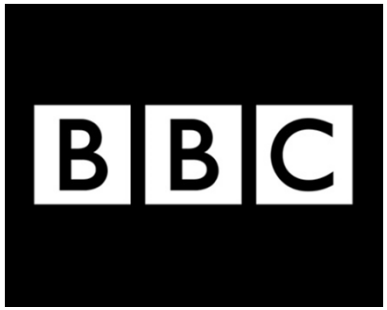
Absents : Sir W.H. BRAGG, H. DESLANDRES et E. VAN AUBEL

UCL Systems Engineering 2013 COMP2013-2014

- Dr Graham Roberts
- Dr Dean Mohamedally
- Dr Lorna Wall
- Dr Simon Julier

- UCL Computer Science, UCL Management Science and Innovation, UCL Electrical Engineering, UCL Mechanical Engineering, UCL Chemistry, UCL Slade School of Arts, UCL Advances, Royal College of Arts and others.

Technology Sponsors



Students ready for a great challenge?

- 100% of CS first years have worked on apps with companies and charities, first hand experience with clients
- Resources: Largest education account for cloud computing (Microsoft) in Europe. Tech funds for prototypes and hardware to experiment with.
- Industry-alignment: syllabus refreshes, updated labs, new HPC clusters (inc. Hadoop cluster), sponsored competitions and awards, hardware/ software donations, industry guest speakers…

Fastest Robot Racers in London

COMP2013: Proof of Concepts (PoCs)

- To solve a problem by foundations of team - based research enquiry, experimentation and validation of results
- To gain breadth of the field in a feel for the current state of the art
- To gain depth of study through real-world problem solving
- To organise, manage and achieve confirmation of results – demonstrating the viable path in a professional manner

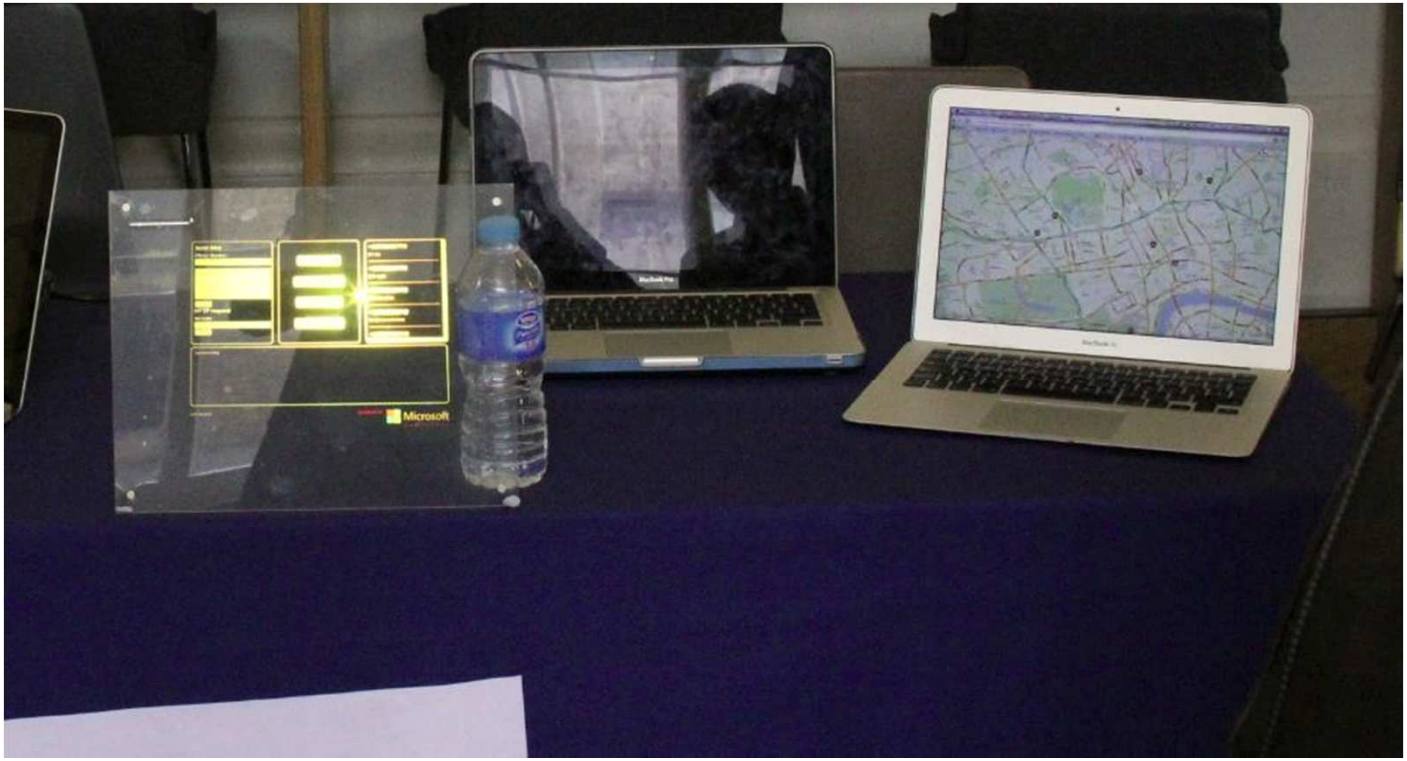
COMP2014: Product Deployment

- To productise with emphasis of successful service creation, delivery and deployment
- To extrapolate a necessary business steered trajectory out of needs, wants and likes
- To consider future outcomes, analytics, best practices, next iterations
- To demonstrate the curriculum of deployment: **design vision + management + engineering**

Last years 2nd year projects

With Rick Rashid (Head of MSR), Jeanette Wing (MSR Global)
and Andrew Blake (MSR Cambridge)

Future of heads up screens in cars?



GPS data, personal profiles, passenger IDs for shared media, on a HUD.
Sponsored by Renault, ATOS and Microsoft

VMs, Cloud and Analytics

- All students will set up virtual machines to simulate specifications, experiment with operating systems.
- Azure cloud accounts for all students.
- UCL's student Hadoop cluster for analytics – first major student cluster in the UK.

The 2013 projects!

- 23 projects sponsored by world-class companies.
- 3 major milestones per term.
- A university wide demos day in January.
- Merged groups with faculties across UCL in Term 2.
- Product launch due in April!

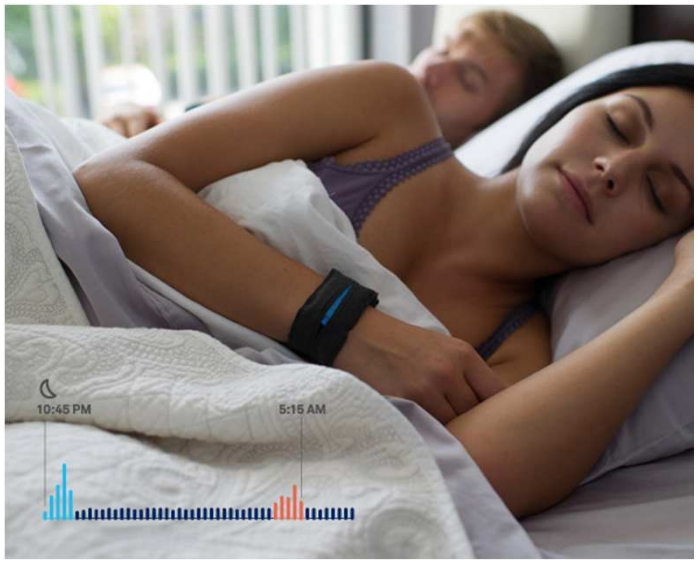
Team 1: “SmartScarf” / Microsoft Research

- Enabling a person to communicate with specific proximity and binaural detection, with a pick up mic, through a wearable scarf interface.

Microsoft Research

Team 2: “SleepStream” / NHS Trust

- Construct combination of sensors (Kinect, motion bracelet, audio sensors) for streaming sleep pattern data
- Pattern analytics to report and establish statistical models
- Aggregate with number of users via Microsoft/UCL Lab-of-things Analytics



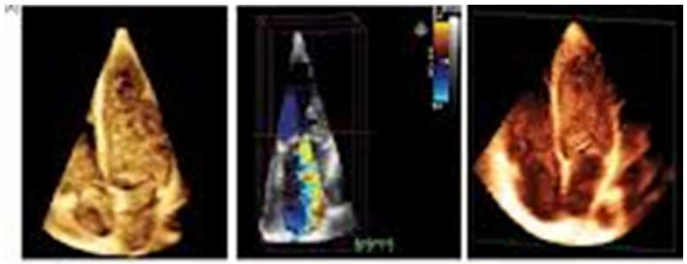
Team 3: “AutoLike” / Facebook / BBC

- Examine patterns of things we “like”.
- Construct social network connected interfaces for Internet of Things.
- Provide APIs for combining sensors with web-services over REST.
- Examine FBML and suggest support for further integration.

Team 4: “HealthPassport” / NHS Trust / Microsoft

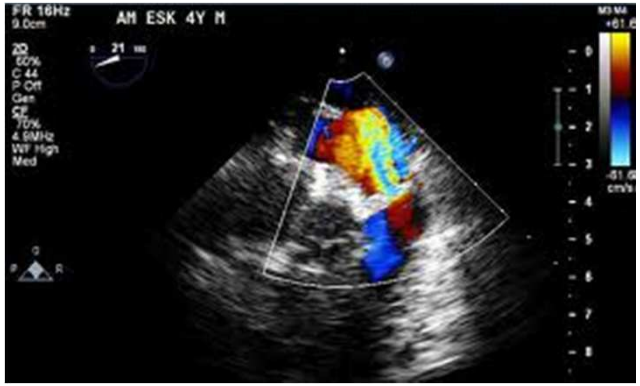
- Develop a hardware based hospital passport for capturing information by patients for doctors to review.
- Focus groups on dementia and learning disabilities.
- Collects “likes” and “dislikes” information and visual evidence. Context aware diary features virtual counselling.
- Web-service for medical subscribers and Hadoop analytics of focus group models.

Team 5: “Cardiopointer” / UCL Heart Hospital / Philips / Microsoft



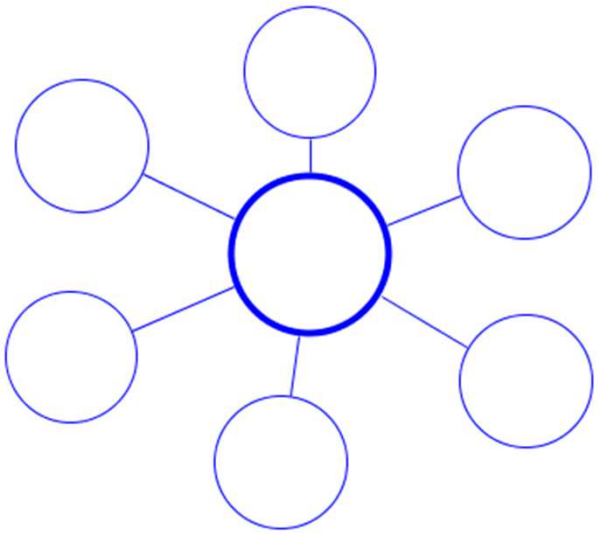
- Volumetric 3D visualisation of merged scans of cardiovascular data (Cartesian Dicom) with MRI/CT.
- Oculus Rift and Leap motion enabled.
- Tagging of information for laser-guided measurement.

Team 6: “Cardiotrainer” / UCL Heart Hospital / Philips / Microsoft



- Video and webservice for creating training materials of 3D visualisations (Philips Qlab).
- Annotation and 3D highlighting, natural language capture, and motion recording in surgery training.
- Mobile delivery platform for trainee discussion.

Team 7: “SolutionFinder” / ISBM / Microsoft



- Project Management Navigation tool for the Institute of Small Business Management - interactive toolkit for exploring project planning contexts.
- Open new knowledge domains from associated literature and popular articles.
- Enable business presenters to expand timelines of a project’s development, with gestures and natural language.

Team 8: “UCL Go” / UCL

- Re-engineering of existing codebase to HTML5
- Provide an API with embedded hardware and analytics platform for UCL Go.
- Construct gesture sensors and kiosk platforms for students on site and on mobile.

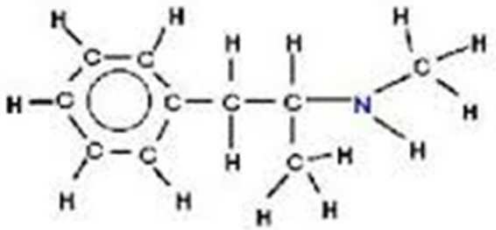
Team 9: “NearShare” / Microsoft Research

- Using near field communications triangulation and accelerometer information, enable mobile devices to share both screens and localised data.
- Screens should be able to scale real estate by being nearby.
- Users should be able to copy and paste information from one device to another by being near it.

Microsoft Research

Team 10: “MethDetector” / UCL Chemistry / Metropolitan Police / Microsoft

- UCL Chemistry and Faculty of Engineering are producing a Meth production sensor array.
- Construct a hardware-based mobile sensor device, mobile and analytics service to enable capture and analysis by police officers.



Methampethamine

METROPOLITAN POLICE

Team 11: “Robocraft” / UCL Faculty of Engineering / Microsoft

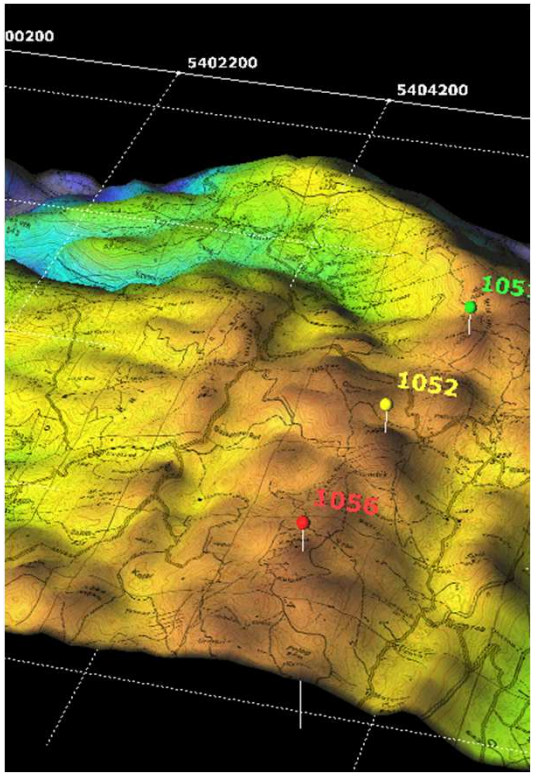
- Build a robotic hovercraft and motion guidance system.
- 3D printed skin.
- Software on performance.

Team 12: “VRCore” / Testaluna games / Unity / Microsoft

- Construct several oculus rift -enabled drag and drop 3D plugins for Unity and games production.

unity

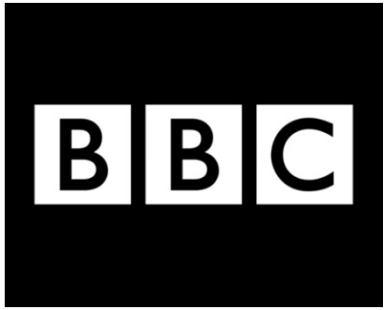
Team 13: “Coaster3D” / Natural History Museum / Microsoft



- A 3D viewer with Oculus Rift and Eyefinity canvas capability for GIS based low altitude maps of coastal areas.
- Provides 3D geographic tagging and highlighting of key information.

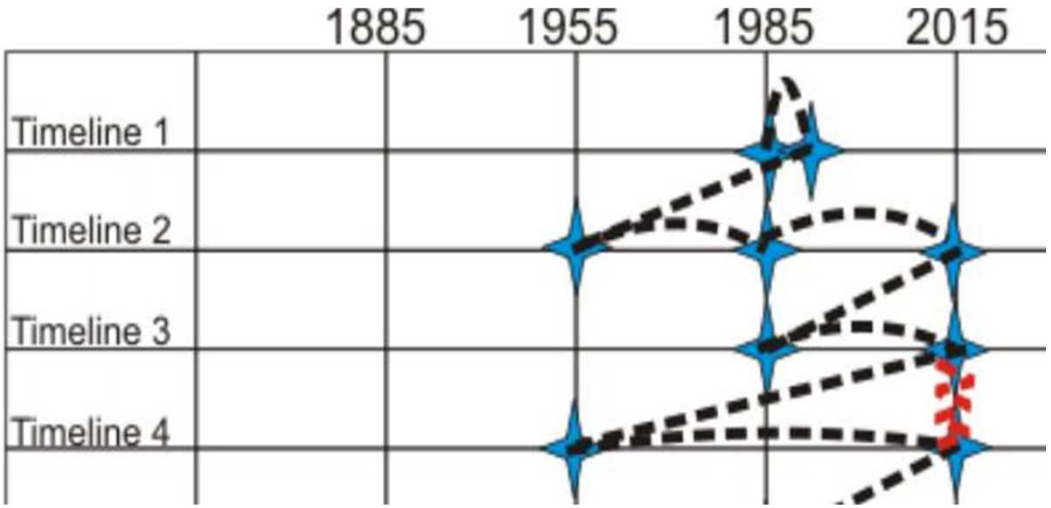
Team 14: “PoliticalMapper” / BBC Works

- Data journalism solution for analysing all of the UK House of Commons debates since 1988. Big data semantics similarity search with Machine Learning APIs.



Team 15: “EthicsReviewer” / UCL Laws / Microsoft

- Navigating critical timeframes in a legal case study raises ethical questions amongst a group of legal experts and trainees.
- Supporting multiple timelines of enquiry, expand models of jurisprudence and provide a navigation means of introducing dilemmas.
- The system will support annotation collection, natural language processing, gestures and information visualisation.



Team 16: “HydraChat” / Microsoft Research

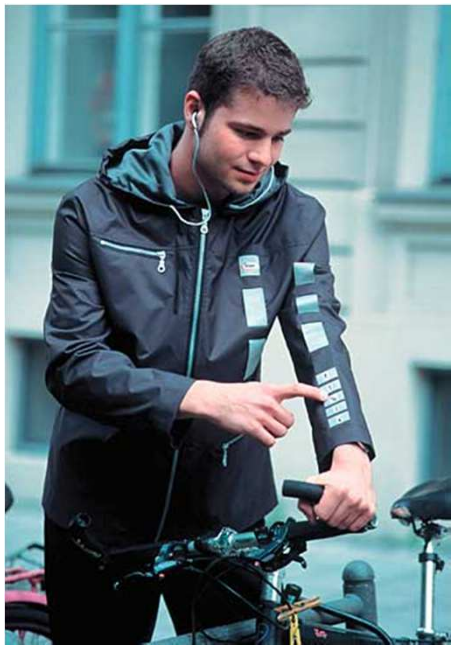
- Construct hardware devices or use existing mobile devices that sit next to each other and enable upto 4 way seamless conversations.
- Various metaphors of size and scale, e.g. card sized devices, or tablets, or projectors next to a whiteboard.
- Proximity sensing for audio gestures.

Microsoft Research

Team 17: “BioIMEI” / Orange Labs / Nokia / Microsoft

- Explore biometrics identification for associating with mobile cloud accounts
- Construct a wearable IMEI to log you into any compatible device.

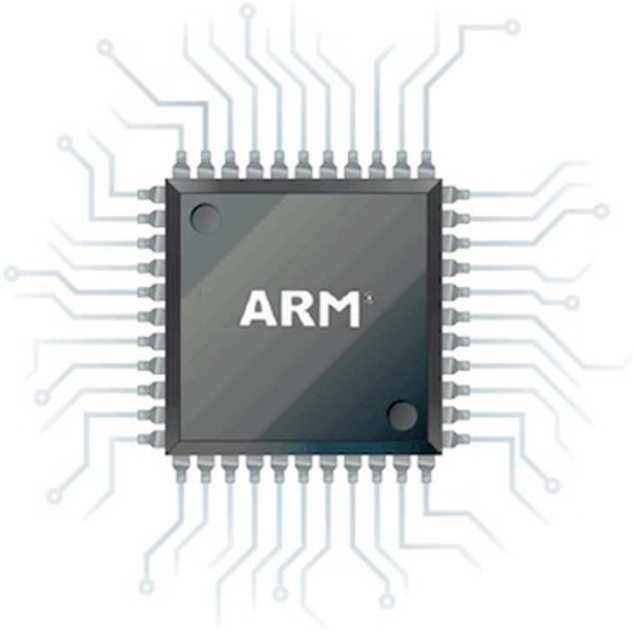
Team 18: “ProtectorWear” / Orange Labs / Metropolitan Police / Microsoft



- Develop wearable devices and embedded sensors that the public and safety officers can use on clothing to assist in public or security use cases.
- Analytics of data including pattern analysis and trend evaluations.

Team 19: “Captain” / UCL / Microsoft Research

- A big data sensor aggregator and profiling device and supporting service.
- Windows 8 embedded device running on ARM. Capable of aggregating multiple sensor data for big data filtering.
- Intended for a variety of real-world use cases such as in hospitals on wards with heart rate sensors, blood pressure etc.
- Should support upwards of 100 sensors and profiles for sensor configurations.

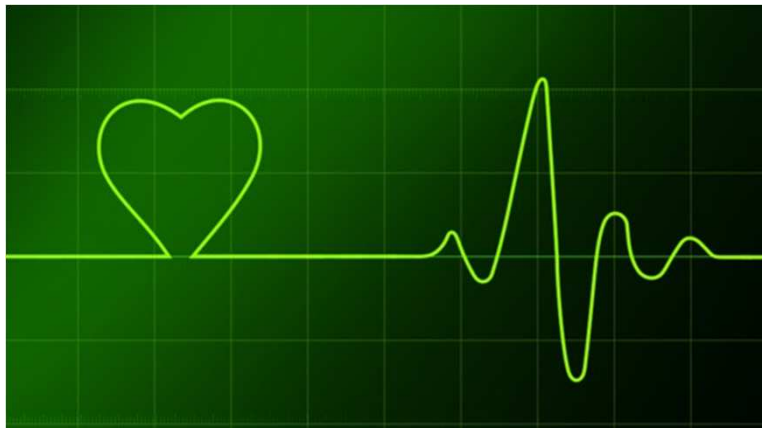


Team 20: “Psion2013” / Microsoft Research

- Re-engineer the Psion organiser to feature up to date technologies with Windows 8, direct access to key apps, long term battery life and high speed networking.

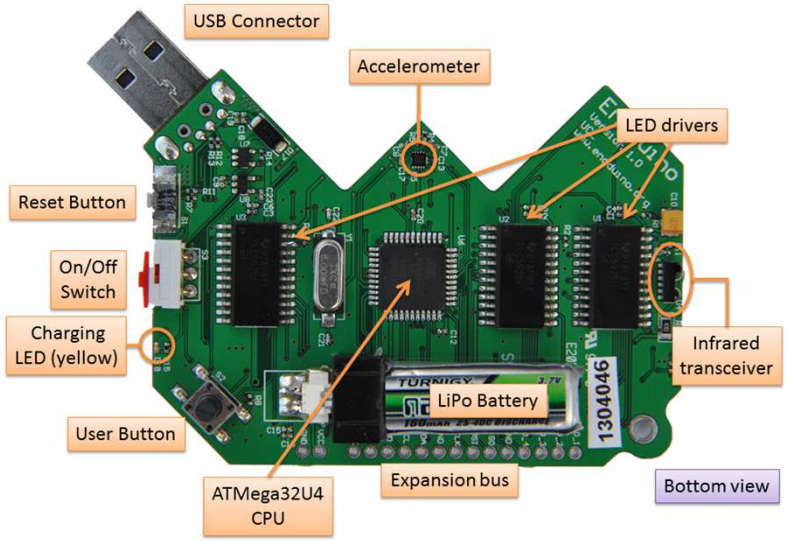
Team 21: “Cytoplasm” / Microsoft Research

- Combining low power small cells of remote devices, provide new models for paired and distributed Internet of Things sensors; e.g pairing a heart rate monitor with a mobile over a long distance.



Team 22: “EngduinoIDE” / UCL / Microsoft Research

- TouchDevelop and other programming languages are to be used in teaching school children to use our Engduino. Develop an IDE with exercises in mind for schools.



Team 23: “Cloudette” / Microsoft Research

- Develop a wifi-enabled portable hard drive solution with webservice and drivers, that can let mobile devices sync to a portable drive and make use of its wifi connectivity to the cloud.