PhD Summer School 2013
1-5 July 2013
Scarlet Schwiderski-Grosche
Welcome!

60 PhD students
• 20 MSR PhD Scholars
• 11 students from Max Planck Institutes
• 18 students from Cambridge Computer Lab
• 11 students related to our joint institutes (BSC and INRIA) and Advanced Technology Labs (Germany, Egypt, and Israel)

From
• 10 countries – Europe PLUS Egypt, Israel and Saudi Arabia

ENJOY YOUR VISIT and HAVE FUN!
Tuesday 2 July 2013

09:00  Welcome to Microsoft Research Cambridge
Andrew Blake, Microsoft Research

09:30  Welcome to PhD Summer School
Scarlet Schwiderski-Grosche, Microsoft Research

10:00  Break

11:00  Strategic Thinking for Researchers
Andy Gordon, Microsoft Research

12:00  Lunch/Poster Session 1

14:00  Parallel Session

- Proving That Programs Eventually Do Something Good
  Byron Cook, Microsoft Research

- Human Computing and Crowdsourcing in Search Evaluation
  Gabriella Kazai, Microsoft Research

15:00  Break

15:30  Parallel Session

- Transformations in HCI: from Human Factors to Human Values
  Abigail Sellen, Microsoft Research

- Programming Proofs and Proving Programs
  Nick Benton, Microsoft Research
Tuesday 2 July 2013

16:30 Coach Transfer to Red Lodge Karting
17:00 Go-Karting at Red Lodge Karting and BBQ
21:30 Coach Transfer to Selwyn College
Wednesday 3 July 2013

09:30 Parallel Session
- **The Data Center Hardware is Changing, but do the Applications Care?**
  Ant Rowstron, Microsoft Research
- **Modelling All Life on Earth. Yes, Really!**
  Drew Purves, Microsoft Research

10:30 Break

11:00 Parallel Session
- **Predictable Data Centers**
  Hitesh Ballani, Microsoft Research
- **Software for Programming Cells**
  Andrew Phillips, Microsoft Research

12:00 Lunch/Poster Session 2

14:00 **3D Vision in a Changing World**
  Andrew Fitzgibbon, Microsoft Research

15:00 Break

15:30 **Cloud Computing—Big Data and Beyond**
  Kenji Takeda, Microsoft Research

16:15 Parallel Session
- **Windows Azure Tutorial**
- **.NET Gadgeteer Workshop**
Wednesday 3 July 2013

17:30 Coach Transfer: Microsoft Research to Selwyn College
    ## free evening ##

OR

17:30 .NET Gadgeteer Hackathon
Thursday 4 July 2013

09:30  Rough Guide to Being an Entrepreneur
       Jack Lang
10:30  Break
11:00  How to Write a Great Research Paper
       Simon Peyton Jones, Microsoft Research
12:00  Lunch/Poster Session 3
14:00  How to Give a Great Research Talk
       Simon Peyton Jones, Microsoft Research
15:00  Machine Learning: the Future of Computing?
       Chris Bishop, Microsoft Research
16:00  DemoFest (including tea and coffee)
17:30  Coach Transfer to Jesus College
18:00  Drinks and Group Photo
19:30  Formal Dinner at Jesus College
22:00  Coach Transfer to Selwyn
Friday 5 July 2013

09:30  Intellectual Property at Microsoft
       Pablo Tapia, Microsoft Research
10:30  Break
11:00  How to Present a Poster at an International Conference
       Sue Duraikan, Duraikan Training
12:00  Coach Transfer to Lunch Venue
12:30  Lunch at Riverside Restaurant
14:30  Coach Transfer to Selwyn College
Learning how to present a poster at an academic conference

Training by Sue Duraikan

- Present your poster to researchers and peers
- General feedback during Sue’s talk on Friday
- 1:1 feedback sessions with Sue (Thursday afternoon in parallel to DemoFest)

→ Sign up at helpdesk
Microsoft Research’s presence

- Research Connections
- XCG
- FUSE Labs
- Redmond
- Silicon Valley
- New England
- New York
- Cambridge
- ATLE
- ATLI
- ATLC
- India
- Asia
- ATL B
EMEA (Europe, Middle East, Africa)
Microsoft Research Connections (a division of Microsoft Research) collaborates with and supports the work of the world’s top academic researchers and institutions.

We establish partnerships to develop technologies that fuel data-intensive scientific research and advance the state of the art in computer science and develop technologies that fuel data-intensive scientific research.

By connecting leading researchers around the world, we aspire to accelerate scientific discoveries and breakthroughs that respond to some of the world’s most urgent global challenges.

Our fellowships, grants, and awards foster and inspire computer and information scientists and the broader research community.

**Imagine.**
A world of endless possibilities—dream the unthinkable and change the world forever.

**Invent.**
Invent a better world—one great idea at a time.

**Inspire.**
Together, let’s inspire the next generation of scientific discoveries.
• Started in 2004
• EMEA academics apply with their research project
• Selected projects start in the following academic year
• Students are co-supervised by an MSRC researcher
• Students often do Internships at MSRC
• Around 20 students a year
• Over 220 PhD students in total (~ 100 active)
PhD Summer School

- Networking
  - PhD Scholars
  - Students from joint research labs (INRIA, BSC, CoSBI)
  - Students from Max Planck Institutes
  - Students sent from ATLs
  - Students sent via Cambridge Computer Lab
  - MSR researchers

- ‘Transferable skills’
  - Write paper or poster, give talk, become an entrepreneur, understand IP laws, ...

- Research talks
  - Latest ‘stuff’ from MSR

- MRC projects talks/demo

- Poster sessions
- Social events
The .NET Gadgeteer Platform

Modular Hardware

Software Tools

void ProgramStarted()
{
    // Initialize GTM.Modules and
    myButton = new GTM.Button(GT
    myLed = new GTM.MulticolorLE
    myButton.

    // Do one
    Debug.Print
}

    ButtonPressed
    ButtonReleased
    DebugPrintEnabled
    Equals
    GetHashCode
    GetType
    IsPressed
    ToString
What is .NET Gadgeteer?

- A rapid prototyping platform for small electronic devices
- Characteristics:
  - Low threshold
  - High ceiling

Gadgeteer school projects

MSR Cambridge

Gadgeteer hobbyist projects

Lancaster

Open University

Syma S207 Remote Control with .NET Gadgeteer
.NET Gadgeteer Binary Clock
Camera Puzzle
Test to Speech for Applications
.NET Gadgeteer Thermometer with LCD
.NET Gadgeteer Servo Camera & Windows Phone Client
Flipbook Maker
.NET Gadgeteer-Powered Robot
Pulse Oximeter Web Service
Arcade Console
Module Tutorial Buttons
Module Tutorial Seed Studio GPS
Connect hardware modules (5 minutes)

Mainboard

Four-way switch

Input potentiometer

Colour OLED display (128x128 resolution)

USB power source and programming socket
public Point[] positions;
public Point displacement;
public Color color;

public Piece(Point[] positions, Point displacement, Color color)
{
    this.positions = positions;
    this.displacement = displacement;
    this.color = color;
}

public void Rotate(bool clockwise)
{
    for (int i = 0; i < positions.Length; i++)
    {
        Point oldpos = positions[i];
        positions[i].x = clockwise ? -oldpos.y : oldpos.y;
        positions[i].y = clockwise ? oldpos.x : -oldpos.x;
    }
}

public Piece Clone()
{
    Piece clone = new Piece((Point[])positions.Clone(), new Point(displacement.
            return clone;
}
Enclosure design (3 hours)
Enclosure 3D printed (~6 hours)

3D printing (6 hours)
Assembly (20 min)
Summer School activities

- Beginners workshop (Wednesday 4.15pm) – learn how to build a simple electronic device  ➔ Sign up at helpdesk
- Hackathon (Wednesday 5.30pm) – learn how to build a simple electronic device and make your own  ➔ Sign up at helpdesk
- DemoFest (Thursday 4pm) – see the platform and selected projects (including Hackathon results)
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Together, let’s inspire the next generation of scientific discoveries.
## Engagement and collaboration focus

<table>
<thead>
<tr>
<th><strong>Advancing the state of the art in computer science</strong></th>
<th><strong>Accelerating discovery and exploration</strong></th>
<th><strong>Inspire the next generation of computer scientists</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computer Science</strong></td>
<td><strong>Natural User Interface</strong></td>
<td><strong>Health and Well-Being</strong></td>
</tr>
<tr>
<td>Fostering innovative research to advance social and human potential</td>
<td>Exploring human-centric ways for people to interact with future computing paradigms</td>
<td>Applying advanced computing technologies to improve health and wellness</td>
</tr>
<tr>
<td></td>
<td><strong>Education and Scholarly Communication</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Empowering the academic community with innovative tools and technologies</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Earth, Energy, and Environment</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accelerating scientific insights that advance our understanding of the natural world</td>
<td></td>
</tr>
</tbody>
</table>
Computer Science

Fostering innovative research to advance social and human potential

Our Computer Science collaboration projects support innovative research on technologies that drive today’s computers. Our key areas of focus include software engineering, semantic computing, parallelism and concurrency, programming languages, and mobile computing.

Here are some of our projects:

- **Project Hawaii**
- **Cloud-enabled mobile computing**
- **Visual Studio research tools**
- **Microsoft web n-gram services**
- **Try F#**
  - Video
  - Blog
- **NodeXL: Network graphs for Excel**

Other Research Accelerators can be found on [Microsoft Research Connections](http://www.microsoft.com).
Natural User Interface

Exploring human-centric ways for people to interact with future computing paradigms

Technology is becoming more natural and intuitive. People already use gesture and speech to interact with their PCs and devices. Such natural ways to interact with technologies make it easier to learn how to operate them. Our Natural User Interface (NUI) collaboration projects focus on facilitating the use of future computer paradigms by keeping the human user in mind.

Here are some of our projects:

Kinect for Windows
- Kinect for Windows home page
- Kinect for Windows SDK
- Blog

Bringing robotics to the surface
- Video
- Case study (PDF)
- Blog

Functional contact lens monitors blood sugar without needles
- Video
- Case study (PDF)
- Blog
Health and Well-Being

Applying advanced computing technologies to improve health and wellness

We collaborate with academic researchers around the world to develop innovative computing technologies and advance research in human health issues. Our Health and Well-Being collaboration projects apply advanced computing technologies—such as data analysis, imaging, sensor networks, and visualization—to provide insight into disease and human healthcare.

Here are some of our projects:

**Adjusting pneumonia vaccination to save lives**
- Video
- Case study (PDF)
- Blog

**Uncovering new ways the human immune system fights HIV**
- Video: Seeking solutions in Africa video
- Video: The human face of HIV
- Case study (PDF)
- Blog

**Supercomputing on demand with Windows Azure**
- Video
- Case study (PDF)
- Blog
Education and Scholarly Communication

Empowering the academic community with innovative tools and technologies

Data collection and analysis, as well as information authoring, publishing, and preservation, are essential components of researchers’ daily work. Our Education and Scholarly Communication collaboration projects enhance educational technologies and simplify the scholarly communication lifecycle with software and services that facilitate the coordinated and seamless flow of data and information.

Here are some of our projects:

- **ChronoZoom: An infinite canvas in time**
  - Video
  - Case Study (PDF)
  - Blog

- **Microsoft Translator Hub**
  - Video
  - Blog

- **Unified game layer for education**
  - Video
  - Blog
Earth, Energy, and Environment

Accelerating scientific insights that advance our understanding of the natural world

Our Earth, Energy, and Environment collaboration projects focus on the development and adoption of technologies for scientific visualization and data management—especially technologies that accelerate insight in the environmental and earth sciences.

Here are some of our projects:

Layerscape, powered by WorldWide Telescope
- Video
- Case Study (PDF)
- Blog

Fighting wildfires with data
- Video
- Case Study (PDF)
- Blog

FetchClimate
Cloud Research Engagement

Helping research communities build scientific tools and data analysis services in the Windows Azure cloud

The Cloud Research Engagement project facilitates and accelerates scholarly and scientific research by enabling researchers to use the power of Windows Azure to perform big data computations in the cloud. We build the components of cloud technology and work with researchers in the field on projects that push the frontier of client and cloud computing.

Here are some of our projects:

- Helping scientists discover new drugs
  - Case Study (PDF)
  - Blog

- Fighting wildfires with data
  - Video
  - Case Study (PDF)
  - Blog

- Searching for genetic causes of disease
  - Video
  - Case study (PDF)
  - Blog

- Supercomputing on demand with Windows Azure
  - Video
  - Case study (PDF)
  - Blog
Microsoft Research Connections’ Video
How to get started?

To learn more
Microsoft Research: research.microsoft.com
Microsoft Research Connections: research.microsoft.com/connections
Collaboration Opportunities: http://research.microsoft.com/collaboration-opportunities

Join the conversation
Microsoft Connections Blog: blogs.msdn.com/msr_er/
Microsoft Research Facebook: https://www.facebook.com/microsoftresearch
Microsoft Research Twitter: http://twitter.com/MSFTResearch
Microsoft Research YouTube: http://www.youtube.com/microsoftresearch