imagine cup | UK 08

Imagine Cup 2008!

Are you ready to help the environment?

Check out the list of Invitationals.

Microsoft

Table of contents

Tags: .NET, Visual Studio, Expression, Web, Windows, Team, Software

These help you understand the technologies and products that are related to the particular competition.

Competition types: individual; teams of up to two individuals (plus academic mentor); teams of up to four individuals (plus academic mentor).

Welcome

The Imagine Cup is one way Microsoft is encouraging young people to apply their imagination, their passion and their skills to technology innovations – making a difference in the world today. Now in its fifth year, the Imagine Cup has grown to be a truly global competition, focused on finding solutions to real-world issues.

This UK competitors' guide will explain the Imagine Cup, the competitions and how you can get started today!

Good luck,

Mark
Academic Marketing Manager
Microsoft UK
http://blogs.msdn.com/markjo

Useful Links

www.imaginecup.co.uk	– registration, guides, quiz, local prizes and more.
www.imaginecup.com	– worldwide site to meet competitors from around the globe and gain access to online competitions.
http://blogs.msdn.com/markjo	– Mark Johnston's blog
http://blogs.msdn.com/edunhill	– Ed Dunhill's blog

Imagine Cup 2008

This year, Microsoft is calling on young programmers, artists and technologists around the globe to

'Imagine a world where technology enables a sustainable environment.'

We're challenging students to bring their ideas to life in a multifaceted competition, made up of nine categories, each catering to a different technological or artistic affinity. Students' work will reflect valuable, real-world solutions, while giving them the opportunity to compete for cash prizes. When coupled with the power of technology, the potential of these young people is unlimited, and the ideas they develop for the Imagine Cup could significantly improve the lives of millions of people around the world.

The worldwide finals will be held in Paris, France in July 2008.

The Imagine Cup is a great way to compete against other students and kick start your career!

Need more reasons to enter?

There are so many problems to solve when we look at the environment, lots of innovative technology to help do it, and fantastic ideas in your head! If that's not enough, we've thrown in some great prizes and opportunities for those who compete here in the UK – have a look at the UK website for more details. The Imagine Cup also offers you the opportunity to meet like-minded students and to win cash prizes. With any luck, you'll be able to take off in the IT industry through the valuable contacts you'll make in UK Imagine Cup events and competitions.

Prizes

Worldwide competitors can win Xbox 360™ Elites and up to $15,000 cash prizes.
Visit **www.imaginecup.co.uk** to discover more.

UK celebration day

June 2008 will see the top UK competitors brought together for a day of celebration, congratulating the top students from around the country competing in the Imagine Cup. Not only will this be a showcase of the best UK student talent, but a great opportunity to rub shoulders with top industry experts, employers and the press. You'll be able to mingle and talk about your work and your aspirations – whether that is going it alone to create the next 'big thing', or getting a life-changing offer from a major UK company.

How do I get started?

Follow this simple three step plan:

1. Take the UK quiz at **www.imaginecup.co.uk.** We're also on Facebook (search for Imagine Cup), so you can share this exciting opportunity with your friends.
2. Register for the Imagine Cup competitions that you are interested in.
3. Compete in the individual competitions. By registering, you will be notified of each competition stage and when you can compete.

   If you're entering a team-based competition such as Software Design, get your friends to join in and start creating a solution to make a more sustainable environment. You could also encourage them to take one of the skills-based challenges or digital art competitions.

The competitions

Nine ways to step up to the challenge:

Technology Solutions	Skills Challenges	Digital Arts
Software design Embedded development Game development	Project Hoshimi IT challenge Algorithm	Photography Interface design Short film
Here's your chance to fuse your creativity, technical know-how, and business acumen to solve some of the toughest environmental problems on the planet. Using Microsoft tools and technology, you'll apply your skills to create innovative, usable software applications on the Microsoft® .NET platform. You will conceive, test, and build your ideas into real applications that can change the world.	These invitationals push your problem-solving and critical-thinking skills to new heights. You'll be challenged to demonstrate your ability to think under pressure, rise to the challenge and get the job done.	Give an artist a new tool and a new world of possibiliwies will be born. Technology has always been a tool for the progress of the arts. Do you have a vision you want to become a reality? This is the place for you to demonstrate your creativity in three competitions that allow you to use technology in ways that push the boundaries of self-expression.

Technology solutions

Software design

In the software design invitational, students create real, dynamic and powerful software solutions using Microsoft tools and technology. Competitors are asked to demonstrate innovation on the Microsoft .NET framework and Microsoft Windows® platform as they conceive, test and build applications that can change the world. This competition is the only one that is run locally and not online. Countries and regions who participate select their own team in advance of the worldwide finals in Paris in July 2008.

Read page 9 for more information.

Tags: .NET, Visual Studio, Expression, Web, Windows, Team, Software
Competition type: Teams of two to four (plus academic mentor)

Embedded development

Devices are becoming smaller and more portable, and are having a bigger impact on our everyday lives. What's the next big thing? Are you up to the challenge of developing a new device that changes our world? Here is your opportunity to unleash your creativity by developing your own computer-based system that helps create a sustainable environment. Using the Windows CE platform, together with hardware we'll provide, you'll have the opportunity to build your own innovative device to solve our planet's toughest problems.

Read the guide on page 13.

Tags: Windows CE, Visual Studio, Hardware
Competition type: Teams of two to four (plus academic mentor)

Game development

Got game? Want game? Video game creation is an evolving frontier, both in terms of entertainment and technology challenges. Using XNA Game Studio Express, a new, easy-to-use game development solution for both Microsoft Windows and Xbox 360™, you'll have the chance to show how game creation can help change the world – and you'll have fun.

Read the guide on page 17.

Tags: XNA, DirectX, Xbox 360, Visual Studio
Competition type: Teams of two to four (plus academic mentor)

Skills challenges

Project Hoshimi: programming battle

Imagine that you are the only one who can save a person, a city, or even a nation from certain destruction. But you've got secret weapons: your programming skills and knack for strategy. Welcome to the world of Professor Hoshimi. Along with his faithful crew of scientists and programmers, the Professor engages in a fantasy battle of life and death. The results play out in a real-time 3D environment with a comic-strip story that pulls it all together.

Read the guide on page 21

Tags: .NET, Artificial Intelligence, Gaming, Agents
Competition type: Teams of up to two individuals (plus academic mentor)

Information technology

This calls upon you to understand the art and science of developing, deploying and maintaining IT systems that are efficient, robust and secure. You will be given a base set of tools and techniques, but still have to work through custom needs and configurations – determining how all the pieces fit together. In addition to analysis and decision-making processes, this invitational challenges you to demonstrate proficiency in the science of networks, databases and servers.

Tags: Windows Server, Networks, Security
Competition type: Individual

Algorithm

This invitational will highlight your ability to solve a problem. Through the discovery, application and implementation of the right algorithms, you can attempt unimaginable feats such as: decoding the human genome; routing millions of packets across networks; and even searching the entire Internet in a nanosecond. This invitational engages sharp minds with brainteasers, coding challenges and algorithmic puzzles.

Read the guide on page 11

Tags: Programming Languages, Visual Studio, Algorithms, Data Structures, Search
Competition type: Individual

Digital arts

Photography	Short film	Interface design
Throughout history, photography has allowed us to capture an emotion and reflect on our past. From recording nature and documenting history, to capturing current events and personal triumphs, photography offers unique insights on cultural and environmental issues. In this year's challenge we ask you to submit a photo essay that captures your perspective on this year's theme: 'Imagine a world where technology enables a sustainable environment'.	In this age of film-for-all, you don't have to be a famous director to tell a meaningful story through moving pictures. From concept and storyboard, to footage and editing, your challenge is to put it all together as you share your unique perspective on the Imagine Cup 2008 theme. This invitational invites you to explore the art and science of telling a story using the latest digital technology. Your film needs to ultimately move your audience to tears, or provide inspiration to take action.	It's great when creativity and usability come together. This invitational challenges designers all over the world to create functional, compelling and forward-thinking user interfaces. You'll have the unique opportunity to envision the interface of your dreams, connect it to the 2008 Imagine Cup theme and show the world how your skills brought it to life.
Tags: Expression, Windows Vista, Digital Photography **Competition type:** Individual	**Tags:** Windows Vista, Video Editing Software **Competition type:** Teams of up to four individuals (plus academic mentor)	**Tags:** Web Design, XHTML, Silverlight, Expression **Competition type:** Teams of up to two individuals

Getting Started Guide

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Software design invitational

Introduction

The software design invitational is run in the UK with the winner of the UK final gaining a guaranteed place at the worldwide finals in Paris in July 2008. At a worldwide level it is a great opportunity to meet like-minded individuals from across the globe and compete at the highest level for large cash prizes.

But the real opportunity for the majority of UK competitors in the software design invitational is the ability to take the skills and knowledge you have picked up while at university, and gain extra fundamental skills. You'll learn how to write a business plan, present to a technical audience, architect a scalable system and many valuable entrepreneurial skills.

The competition is split into three phases evenly across the year, working with your academic commitments. It's easy to get started – all you need is a great idea that helps the environment using Microsoft software.

Competition

To compete in the Software design invitational, you and your team mates have to register via **www.imaginecup.co.uk** and then complete Stage One before progressing on to the next stages.

Key dates

Round	Dates
Submit your idea	Now – Christmas 2007
Innovation Accelerator	February 2008
Code and compete	February – May/June 2008
Celebration day	May/June 2008

Round one – The idea

'The idea is king' was a phrase coined by a previous Imagine Cup competitor, and we've taken this to heart. To enter the first round of the competition all you need to do is to think about this year's theme and find a compelling problem/solution that uses Microsoft technology.

What is your idea? It could be something as simple as a home automation system that plugs into Windows Vista® Media Centre, monitoring electricity usage and turning off unused devices; or it could be a piece of software that makes a vehicle, product or device more efficient.

Once you have the idea and an understanding of how you would build the solution using Microsoft technology, you just need to download the Software Design submission form and e-mail it to us. We will then pick the top teams to go through to the Innovation Accelerator round.

More information

To find out more, head over to **www.imaginecup.co.uk**, take the quiz (don't forget about the prizes!) and read the Software Design section linked from the main navigation site.

Round two – Innovation Accelerator

The Innovation Accelerator is a prize in its own right, introducing the teams with the best ideas to industry experts, Microsoft employees and business greats – get ready to develop that idea into a great solution in an amazing three day workshop.

During the first part you're invited to hear presentations from leading industry speakers on software, business and environmental issues, to help you fully understand the context of the Imagine Cup and the great opportunity your team is involved in.

Next, all the teams will work on developing their idea into a proper software project. This will consist of creating a software architecture – are you going to go through a browser or a desktop? Use XML or binary code? Hardware or software only? Are you developing a business plan to either make a profit or at least be self-sustaining? Finally, how you would function as a team and develop the solution for real, possibly the greatest skill for those wanting to work in IT).

Teams will then go off with a set of new skills and a plan to develop their solution – potentially the one that will represent the UK at the worldwide finals.

Round three – Code and compete

After the Innovation Accelerator, you have two months to write some code that proves your idea and the plan from the workshop (you can have already started this by the way – hint, hint!). The code doesn't have to be a commercially ready product or service. Instead, think of it as a prototype showing off all the best bits of your solution – the UI, the smart algorithms, the Web services and other important components.

Algorithm Invitational

Algorithm Invitational

Algorithms exist almost everywhere in everyday life, from bus and train timetable control, to government statistical analysis and bank database management.

In the modern world of personal computing and next-generation processors, we still have a shortage of people who are able to write effective algorithms to accomplish unimaginable feats, like decoding the human genome, controlling hardware, or simply searching the Internet effectively.

The Algorithm Invitational gives you the opportunity to show you've got what it takes to overcome a technical problem using pure skill. The Imagine Cup Algorithm Invitational consists of brain teasers, coding challenges and algorithmic puzzles – seeking to engage the sharpest student minds with Microsoft technology.

What's involved?

Round one

The first round involves participating in an online multiple-choice quiz. You will be asked to answer a series of questions to test your code knowledge, visual problems and problem-solving. To take the quiz, you will need a Web browser, such as Internet Explorer®.

Round two

The second round involves a 'Take home challenge', where you'll use project starter files for a series of problems (such as efficient routing through a network or text parsing). You will also have to use one of the .NET family of languages (either Visual C# or Visual Basic®) to complete these tasks. You will be required to deliver your source code and compiled code to successfully complete this round.

Getting Started

In the first round, you will be answering an online quiz. Here is an example of what a question might look like:

```
        int[] ints = new int[] { 10, 20, 30, 40 };
        GetLargestNumberInList(ints);
public static int GetLargestNumberInList (int[] ints)
{
        int largest = int[0];
        foreach(int i in ints)
        {
                if(i > largest)
                largest = i;
        }
}
```

What will the value of Largest be?

- 10
- 20
- 30
- 40

The correct answer in this case is **40**.

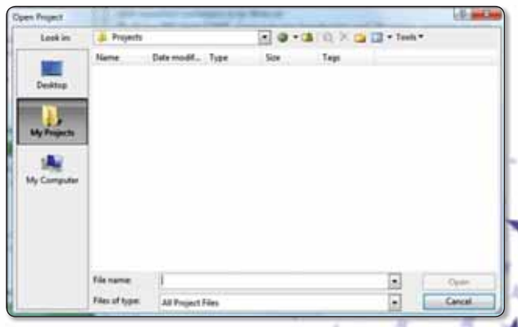
To develop algorithms for the Imagine Cup second round, you'll use one of the .NET family languages again. You can download either the Visual C# or Visual Basic Express products for free from the MSDN Web site **www.microsoft.com/vstudio/express**) (see Fig. 1).

Fig 1:

Once you've downloaded the packages you require, simply follow the onscreen instructions and install your chosen language.

To get started, open the project starter files with your chosen Visual Studio Express product (see Fig. 2). You will be supplied with the project starter files at the beginning of the round.

Fig 2:



Resources

- Imagine Cup Website: www.imaginecup.com
- Microsoft Developer Network Website: http://msdn.microsoft.com

Embedded Invitational

Embedded Invitational

Devices are becoming smaller, more portable and are having a greater impact on our everyday lives. Without mobile phones, we'd be lost; without cameras, we'd be forgotten; without PDAs, we'd be swamped with paperwork.

The Imagine Cup Embedded Invitational gives you the chance to go beyond desktop development and build a complete solution using our hardware and Windows CE. This year's Imagine Cup theme is 'imagine a world where technology enables a sustainable environment'. You'll need to be part of a team of two to four competitors and develop a software device that will solve environmental problems. You may even follow the path of former winners, using your ideas to start your own company, or to jumpstart into your future career.

What's involved?

Firstly you'll have to think of a proposal for an Embedded system, then you'll have to start building and designing the software to run it. Think of it as 'finding a solution to solve a problem'.

Getting started

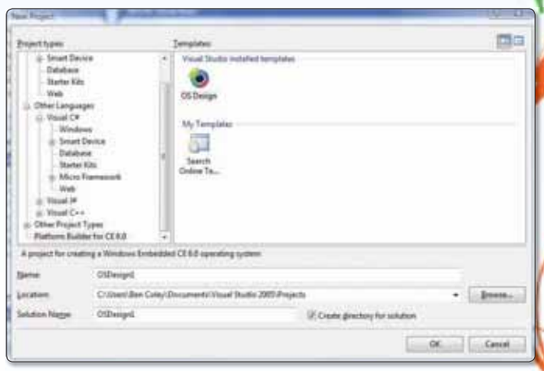
To develop and deploy Windows CE to a device, you'll need to use one of the .NET family of languages and the Windows CE Platform Builder.

The software you need to get started will be supplied with your Embedded hardware during the competition.

Once you've installed Microsoft Visual Studio® and the Windows CE Platform Builder, simply follow the onscreen instructions to begin writing your own Embedded software package.

The Windows CE Platform Builder is a simple-to-use plug-in for Visual Studio. This means that all Embedded platform development can be done from one familiar environment.

Fig. 1:



Guide to deploying an Embedded image

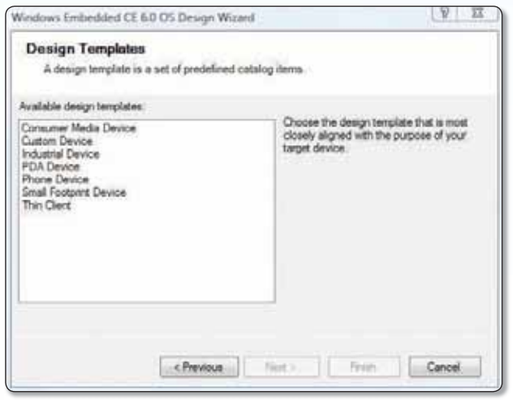
It's easiest to think of an Embedded image as a stripped-down version of Windows; one that contains the drivers and components required for operation, and nothing else. By completing the following steps, you'll be on your way to creating a software solution that runs on a Windows Embedded device.

To start building your first Embedded image, launch Visual Studio and create a new project (File > New Project), then simply select the Platform Builder option from the left-hand list and click OK (see Fig. 1).

Embedded Invitational

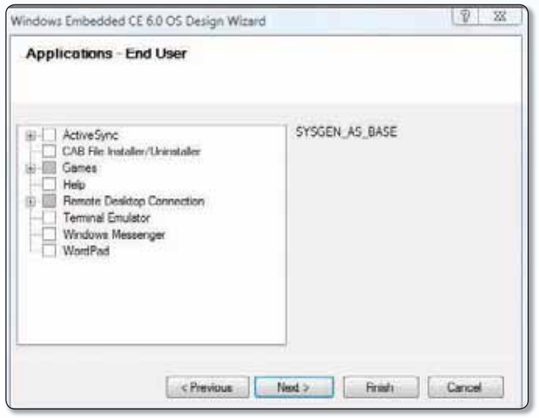
Next, you'll be presented with the Windows CE OS Design Wizard (see Fig. 2). Simply proceed through the wizard following the instructions to create a new image. You'll need to specify which Board Support Packages you require for your hardware and which template you want to use.

Fig. 2:



Next, you'll be presented with a choice of programs to install. Select the .NET Compact Framework 2.0 here, and use this chosen Visual Studio language at a later stage (see Fig. 3).

Fig. 3:



Finally, you'll need to select which Networking abilities you want your device to have (Bluetooth, TCP/IP, etc.) (see Fig. 4).

Fig. 4:

That's it! Once the wizard is finished, you'll be back in the developing environment, with your newly created image in view. From here, you'll be able to write applications, import more drivers and packages and deploy your image to your device. Kick start this by right-clicking 'Subprojects' from the Solution Explorer Window (see Fig. 5) and clicking 'Add New Subprojects'.

Fig. 5:

To test your image, use the bar at the top of the Visual Studio window to 'configure debugging on an emulator'. To deploy your image, use the same bar to 'configure deploying to a device'.

Resources

- Windows Embedded™ Home: www.microsoft.com/windows/embedded
- Windows Embedded Developer Centre: http://msdn.microsoft.com/embedded

Game Development (XNA)

Game Development (XNA)

XNA is Microsoft's new game building platform for both Windows and the Xbox 360, based on the .NET Framework. XNA Game Studio Express is an add-on for Visual Studio C# Express, which gives developers the opportunity to target this platform.

What's involved?

Round one

The first round of the Game Development Invitational will see teams of two to four people download source code for a game, compile, fix bugs and implement new features. The updated and compiled code will then be submitted back to Microsoft for review. All teams who fix the bugs and implement the required features correctly advance to round two.

Round two

In round two, teams will be required to show their creativity and technical skills by building upon the baseline game and creating a unique entry. Compiled code is submitted for judging and the forty best entries (internationally) advance to round three.

Round three

Round three will see teams create their original games and submit their compiled codes, along with a two minute video demonstrating the games' features. Judges will select the top ten and these will advance to the worldwide final in Paris.

Below is our guide to getting started with XNA. It will give you the information you need to set up the IDE, download and install a sample game, add new features and deploy. This should give you all the skills you need to enter round one of the Imagine Cup Game Development Invitational.

Getting started

Before you can develop games for XNA, you need to download and install Microsoft Visual C# 2005 Express Edition and XNA™ Game Studio Express. This will give you the IDE and allow you to code the game, then build and deploy it.

Visit http://creators.xna.com/Education/GettingStarted.aspx for a list of the required components and how to install them.

Once you have installed XNA Game Studio Express, you can jump right in by navigating to the Microsoft XNA Game Studio Express folder in your Start Menu, and clicking XNA Game Studio Express (see Fig. 1).

Fig. 1:

Modding your first game

XNA Game Studio Express comes with a game project pre-installed. The project is called Spacewars and is a complete XNA game ready to be compiled. Because you have the source code for the game, it is an excellent way to start getting used to XNA Games Studio and writing your own code by implementing some new features. The following guide explains how to get started with the Spacewars project and demonstrates how to implement these new features in the game.

Game Development (XNA)

- To begin, open the Spacewars project for Windows. In XNA Game Studio, select the 'File' menu and 'New Project' (Ctrl+N).
- In the 'Visual Studio installed templates' section, select 'Spacewar Windows Starter Kit' (see Fig. 2)

Fig. 2:

- The project will load and you can press F5 immediately to build and deploy the game.
- As an example of how easy it is to make a change to the game, or implement a new feature, change saucer ship in the 3D game into an asteroid (so that player 1 can play as a ship which looks like an asteroid).
- First open the 'EvolvedShape.cs' file from the 'Evolved' directory in the 'Solution Explorer' (see Fig. 3)

Fig. 3:

- Change the p1_saucer ship mesh to the asteroid2 mesh (see Fig. 4)

Fig. 4:

```
#region filenames
private static string[,] shipMesh = new string[,]
{
    {
        @"models\p1_pencil",
        @"models\asteroid2", //@"models\p1_saucer",
        @"models\p1_wedge",
    },
    {
        @"models\p2_pencil",
        @"models\p2_saucer",
        @"models\p2_wedge",
    }
};
```

This changes the mesh for player one's second ship option to the DirectX resource located in /Content/Models/astoroid2.x

- Next, change the texture for player one's second ship option to match the mesh (see Fig. 5).

Fig. 5:

```
private static string[,] shipDiffuse = new string[,]
{
    {
            @"textures\pencil_p1_diff_v{0}",
            @"textures\asteroid2",//@"textures\saucer_p1_diff_v{0}"
            @"textures\wedge_p1_diff_v{0}",
    },
    {
            @"textures\pencil_p2_diff_v{0}",
            @"textures\saucer_p2_diff_v{0}",
            @"textures\wedge_p2_diff_v{0}",
    }
};
```

This changes the texture to the resource located here: /Content/Textures/astoroid2.tga

- You can now recompile (F5) and see the changes you've just made in the game. This should give you an idea of just how easy it is to make changes to existing games. For other projects and tutorials on XNA visit **www.creators.xna.com**

What's next?

Now you have completed the above guide, you are ready to compete in round one of the Games Development Invitational of the Imagine Cup. Take a look at the resources below and go to **www.imaginecup.co.uk** to enter the competition.

Resources

- XNA Creators club: http://creators.xna.com
- XNA Developer Centre: http://msdn.com/xna
- XNA Game Studio Express forums: http://msdn.com/xna/forums
- XNA Game Studio Express blog: http://blogs.msdn.com/xnaXNA

Project Hoshimi: programming battle

Project Hoshimi: programming battle

Do you love strategy and video games?
Can you program or do you just want a great way to learn?

In Project Hoshimi, you'll be creating a strategy that represents the behaviour of a team of microscopic robots ('nanobots') that have to work together inside the human body to cure it of a deadly virus. Once done with your strategy, you'll be able to enjoy watching it play out in a real-time 3D world.

Project Hoshimi is a programming challenge where participants develop a strategy for nanobots to follow. The strategy is then played out in a real-time 3D environment. There are various scenarios and characters that need to be programmed – a full Software Development Kit (SDK) is provided.

What's involved?

Round one

Here, the focus is on starting to develop a game strategy. Little programming is required – all your strategy will be developed using a graphical user interface.

To succeed in round one, you will need to fulfil a set of criteria, to be completed by your nanobots. The good news is that everyone who meets these criteria and uploads their strategy file to the Imagine Cup Web site, will proceed to round two of the competition. In the SDK you will complete round one in 'Discovery Mode'.

Round two

Round two sees competitors get more involved with the programming of your nanobots with more advanced SDK and more challenging objectives – for example you may have to write a strategy that will adapt to maps and terrains you've not seen before. You will also have competitors trying to complete the objectives at the same time as you, adding an extra level of complexity. In the SDK you will complete round two in 'Intermediate Mode'.

Once through this round, a short eliminator battle will determine the top six teams to advance to the worldwide finals in Paris. These teams will then battle it out in a twenty four hour live competition!

Getting started

Installing Hoshimi

Project Hoshimi requires the installation of SDK, which will allow you to devise strategy for your nanobots and see it played out live in a 3D environment.

1. Before you can install the SDK you need to ensure you have Microsoft .NET Framework version 2.0 installed on your machine – to check which version you have installed, follow instructions here: **http://support.microsoft.com/kb/318785**. Windows Vista has the .NET Framework pre-installed, but for Windows XP it will need installing. Refer to the resources section at the end of this guide for the download URL.
2. Download and Install the Project Hoshimi SDK from here: **www.project-hoshimi.com/downloads.aspx**

Built-in tutorials

1. Once installed, launch Project Hoshimi and create a new user (see Fig. 1).

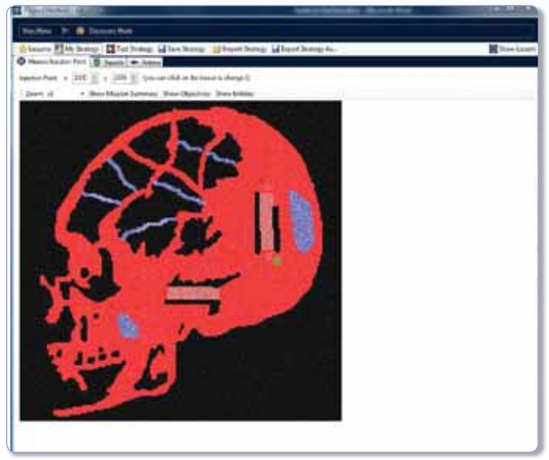
Fig. 1:

2. Create or select a username and click start.
3. You will be presented with the main menu where you can select a game mode: either Discovery, Intermediate or Expert. We recommend you start with Discovery Mode. You are now ready to start the missions.
4. To begin a lesson, select it from the left hand pane. A lesson viewer with instructions will open to the right of the screen. Click 'Load this Lesson' to get started (see Fig. 2).

Project Hoshimi: programming battle

5. You can switch back the list of lessons by selecting the ‘Lessons’ button.
6. Once you have followed the steps set out in each lesson, you can test your strategy in the 3D environment by clicking ‘Test Strategy’.

Fig. 2:



Your first battle!

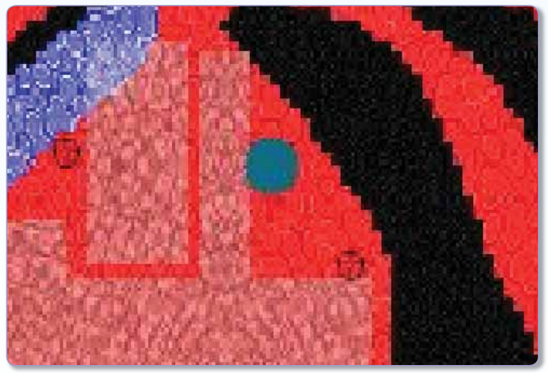
NOTE: This tutorial is based on Project Hoshimi 2007 and uses the 2007 SDK. The 2008 SDK will be updated to use Windows Presentation Foundation and XNA to provide an even better visual experience. However, the principles discussed here will carry through and prepare you for round one of the 2008 invitational.

The following guide will walk you through choosing an injection point, creating nanobots and giving them behaviours. This should equip you with the skills necessary to succeed in round one.

1. Open Project Hoshimi and sign in with your username.
2. On the main menu select ‘Discovery Mode’.
3. Load a lesson by selecting it from the left-hand pane.
4. Choose an injection point. Depending on the objectives of the mission you will want your nanobots to be injected into different areas of the map. To do this:

- Click on your chosen location on the map. A blue dot will indicate your chosen injection point (see Fig. 3), to move it just click somewhere else on the map.
- As a rule, you will want to be injected into the location that is most central to all the objective points.

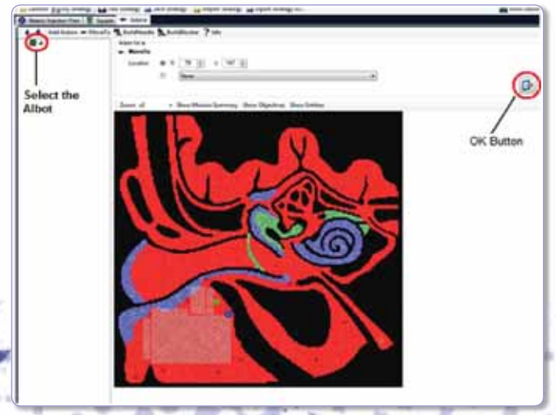
Fig. 3:



5. Next, we must tell our Nanobot to move round the objective points. Normally there is a limit on the number of moves that navigation objectives must be completed in.

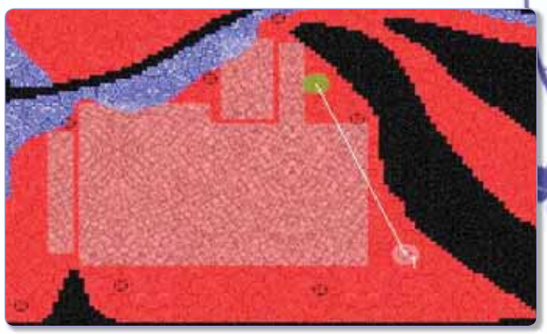
   To do this, select the ‘Actions’ tab at the top of the screen, then select the AIbot from the left hand pane (see Fig. 4)

Fig. 4:



6. Click the ‘Move To’ button and click the first objective point on the map. You will see the co-ordinates of the objective point are populated in the ‘X’ and ‘Y’ location fields.
7. Click the ‘OK’ button to save the action (see Fig. 4). You will now see a line drawn from your injection point to the first objective point indicating the path your nanobot will take (see Fig. 5).

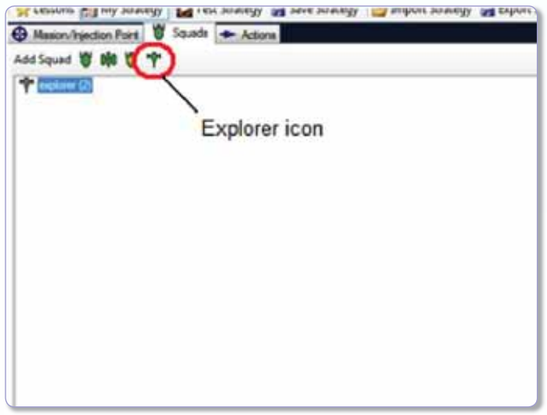
Fig. 5:



8. Next, create more nanobots so to complete navigation objectives faster. There are several different types of nanobot you can build, each with a particular use. For the time being, create a squad of explorer bots.

9. Select the 'Squads' tab.
10. Click on the Explorer icon (see Fig. 6) and complete the name field in the 'Squad Details' pane. You can create squads with differing numbers of nanobots depending on what you want them to do. You can also check the box 'Attack Enemy'. If selected, the squad will attack enemy bots once they have completed their assigned actions.
11. Click the OK button to save the squad (see Fig. 6).

Fig. 6:



12. It is now possible to assign actions to the squad in the 'Actions' tab.

What next?

- Some missions will require the collection and transfer of 'AZN'. For these objectives you will need to use either 'Collector' or 'Container' squads, and 'Collect From' and 'Transfer To' actions.
- So far, only simple strategy would be required to complete missions. However, there are more considerations to be made when planning strategy for your nanobots.
- You will notice that the map shows areas marked with different colours (see Fig. 4). These colours mark different tissue densities which your nanobots will navigate through at slower speeds, therefore using more turns to complete objectives.
- You will also notice streams of moving currents on the maps. These streams are flows that your nanobots will move through. Streams can be used to quickly move between objectives, but equally they often get in the way when they are flowing in the opposite direction.
- Finally, you must consider enemies. Enemies can be static or mobile and will kill your nanobots if they come within range. Some types such as 'Protectors' are able to defend themselves against enemies while other types such as 'Containers' are not.

So now you're ready to enter round one of the Project Hoshimi invitational of the Imagine Cup. Check out the below resources and head over to www.imaginecup.co.uk to compete.

Resources

- Project Hoshimi Homepage: www.projecthoshimi.com
- Project Hoshimi blog: http://projecthoshimi.spaces.live.com
- .Net Framework installation files: http://msdn2.microsoft.com/en-us/netframework/aa731542.aspx

www.imaginecup.co.uk