FUSION Initiative – Application Form

Reference: FI/232/ OOS

Company: Nvolve Ltd

Notes – Please read before completing the application form

- Applicants should submit this form only; supplementary material such as CV's will not be considered.

- Applications should be completed in **BLOCK LETTERS** using **BLACK INK** (either **hand-written or typed**).

- Please return completed form to: **Maeve Parkinson, PricewaterhouseCoopers LLP, Waterfront Plaza, 8 Laganbank Road, Belfast, BT1 3LR** or **Laura Walsh, PricewaterhouseCoopers, One Spencer Dock, North Wall Quay, Dublin 1.**

- **Alternatively you can email the form to pwcni.recruitment@uk.pwc.com or fax to our Belfast office on 0044 (0)28 9041 5820.**

- In order to be considered your completed application must be returned **no later than 5pm on Friday 5th October 2007.** If faxing a form, please telephone 0044 (0)28 9041 5375 to confirm receipt.

- All application forms returned by the closing date will be acknowledged within 7 working days. If you do not receive an acknowledgement within this time please contact Maeve Parkinson on 028 9041 5375.

APPLICANTS HAVE RESPONSIBILITY FOR ENSURING ALL APPLICATION FORMS ARE RECEIVED BY PRICEWATERHOUSECOOPERS LLP ON OR BEFORE THE CLOSING DEADLINE. APPLICANTS SHOULD TAKE ACCOUNT OF DIFFERING POSTAL ARRANGEMENTS AND TIMESCALES IN BOTH JURISDICTIONS AND ON A CROSS-BORDER BASIS.

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Surname:	Forenames:(Please underline name by which you are known)	Title:(Mr/Mrs/Ms/Dr)
BELL	DAVID JOHN	Mr.

Address for Correspondence:	Telephone Numbers: (Please provide a number at which you can be contacted in relation to your application)
15 Beechgrove Omagh County Tyrone Northern Ireland	Home: +44 (0)28 8224 5986 Mobile: +44 (0)7786 718871 E-mail: david.bell@cantab.net
Postcode: BT79 7EW	(Office, if applicable):

Detail your qualifications: GCSE, A Level and/or others

Examining Board	Subject	Level	Result
CCEA	Additional Mathematics	G.C.S.E.	A*
CCEA	Biology	G.C.S.E.	A*
CCEA	Chemistry	G.C.S.E.	A*
CCEA	English	G.C.S.E.	A*
CCEA	English Literature	G.C.S.E.	A
CCEA	Geography	G.C.S.E.	A*
CCEA	Information Systems	G.C.S.E.	A*
CCEA	Mathematics	G.C.S.E.	A*
CCEA	Physics	G.C.S.E.	A*
CCEA	Spanish	G.C.S.E.	A*
CCEA	Chemistry	G.C.S.E.	A
CCEA	Information & Communication Technology	A-Level	A
AQA	Information & Communication Technology	A-Level	A
CCEA	Mathematics	A-Level	A
CCEA	Physics	A-Level	A

2 Education and Qualifications (cont)

Further and Higher Education
If you have attended Further Education, please provide details as follows

Degree, Diploma or Certificate

University or college	Cambridge University (Emmanuel College)
Dates of attendance	Oct 2004 – June 2007
Subject title of qualification (e.g. Mechanical Engineering)	Computer Science
Type of degree, diploma or certificate including class & division (e.g. BA (Hons) 2.1)	B.A. (Hons.) 2.1

Main subjects taken *

First Year: Mathematics for Natural Sciences, Physics, Professional Practice & Ethics, Java, Digital Electronics, Operating Systems

Second Year: Compiler Construction, Computer Design & ECAD, Computer Graphics & Image Processing, Digital Communication I, Economics & Law, Numerical Analysis

Third Year: Additional Topics, Advanced Graphics, Business Studies, Digital Communication II, Distributed Systems, E-Commerce, Human Computer Interaction, Information Retrieval, Natural Language Processing, Optimising Compilers, Security, VLSI Design

Date awarded | 29th June 2007

Post Graduate Qualifications

University or college	
Dates of attendance	
Subject title of qualification (e.g. Food Technology)	
Type of qualification, Masters, Phd	

Main subjects taken

Date awarded |

* Over the three years there was a total of 62 courses available many of which were optional depending on the examination structure. I attended over 50 of the courses but have only listed the ones I found most interesting/enjoyable.

2 Education and Qualifications (cont.)

Please provide details of any projects /dissertations/ theses/ reports that you have produced for the above course(s).

Final Year Individual Project: JPEG Tutor (www.jpegtutor.co.uk)

This project took the form of an interactive web applet which allowed users to see the effects of adjusting the JPEG quantisation matrix on any image they wished to use. In addition, an interactive tutorial explaining the processes involved in the JPEG algorithm was included as an extension to the project. The evaluation comprised of a review of the performance criteria (which discussed how my efficient implementation improved performance by a factor of 14) and a comprehensive user study. The results provided a strong positive conclusion to the 110 page dissertation which earned a first class mark of 74%. The applet will be used by Dr. Neil Dodgson as part of the Computer Graphics & Image Processing course to teach future year groups about JPEG.

Second Year Group Project: Synthetic Sudoku (www.sudoku.davidjbell.me.uk)

I was a member of a team of six that developed a Java program that generated interactive Sudoku puzzles of different difficulties. In addition to the basic requirements we added a comprehensive hint system, a scribbles facility and a multiplayer mode where two players could compete against each other on the same puzzle. I was responsible for the user interface and ensuring that all the individual code contributions came together. I also designed the group logo, took minutes at the meetings and assisted with testing, debugging, documentation and presentations.

Second Year Hardware Project: Decoding the Rugby Time Signal

Involved writing Verilog and ARM assembler to decode the time signal and display it on 7-segment LED displays.

Other professional qualifications (if applicable):

Date	Course	Qualifications

Membership of professional institutions/associations(if applicable):

Member of the Institution of Engineering & Technology (MIET)

3. Employment History

Detail all your employment / self – employment (and unemployment), starting with your current/most recent employment.

Employer Name and Nature of Organisation providing a brief outline of the nature of business	Position Held	Dates (Month and Year) From To	Career Narrative (Job Title, department name, reporting structure, key duties and responsibilities including, research activity, if appropriate, etc.) Please indicate corresponding salary level.
Omagh Academy Controlled Grammar School. (Western Education & Library Board).	Temporary Lab Technician	Aug. - Sept. 2006 (4 ½ weeks total)	Temporary employment as a science lab technician in the Physics & General Science department. This mainly involved setting up physics experiments, preparing apparatus and administration work (typing letters, preparing handouts, maintaining chemical inventory, testing and documenting radioactive sources). I also encouraged pupils to take part in Paperclip Physics suggesting ideas they could develop. Whilst there I designed tickets for the annual school speech day and assisted with IT problems within the school.
Omagh Academy Controlled Grammar School. (Western Education & Library Board)	Temporary Lab Technician	September 2004 (3 ½ weeks total)	Temporary employment as a science lab technician in the Biology & Chemistry departments. This involved setting up experiments, preparing exact solutions, washing and drying glassware and other apparatus, looking after the school animals and plants. Also assisted with IT problems.
CreativeMedia (Graphic Design company based in Omagh specialising in brochures & websites)	Work Experience	January 2003 (1 week)	Work experience placement where I gained valuable experience working with Photoshop, Quark and other professional packages on Macs. Also learned more about the entire printing process and colour management.
First Omagh Boys' Brigade	Voluntary Work	1998-present	Voluntary leader with Anchor Boy section (5-8 year olds) some of my responsibilities include maintaining the member database and organising games nights. I also produce the annual programme for parents' night and maintain the website.

3. Employment History (cont)

Employer Name and Nature of Organisation providing a brief outline of the nature of business	Position Held	Dates (Month and Year) From To	Career Narrative (Job Title, department name, reporting structure, key duties and responsibilities including, research activity, if appropriate, etc.) Please indicate corresponding salary level.

In the following section, you are asked to provide details in relation to a number of skills and qualities, which have been identified as being important. Your answer to each question should outline **HOW you have demonstrated the skill / quality. You should draw on valid experience from academic, employment or voluntary contexts.**

Q1. Working with Information

Please provide an example of when you have had to gather information from a variety of sources, collate and analyse this information and come to a conclusion on the basis of the information presented. You should explain exactly what you did. Your example may be drawn from your academic life or your work environment.

As part of the evaluation for my final year dissertation (an interactive applet 'JPEG Tutor') I conducted a comprehensive user study involving 17 students from different year groups and subjects. Each of the user studies took between 40 minutes and 1 hour to complete which was a huge demand on time but necessary to obtain sufficient data for analysis. There were other practical issues that I had to deal with as well including ethics, consent, incentives and a suitable location to perform these studies. The study was split into three main parts; observed exploration, structured tasks and a questionnaire. The observed exploration was designed to see how intuitive the applet was without any guidance, the structured tasks were designed to see how the applet assisted or hindered users in carrying our common operations and the questionnaire was designed to collect quantitative data and to provide a pseudo-anonymous channel through which more accurate opinions could be recorded. The quantitative results were the quickest and easiest to analyse as most of the questions were based on a Likert scale which meant that the results could be easily graphed. However the qualitative results were much more interesting as they tended to give an explanation to the quantitative results. The exercise was extremely valuable and allowed me to identify some minor usability issues and write a strong positive conclusion for my dissertation.

Q2. Problem Solving

Please provide an example of a time or situation when you encountered difficulties / upset to a plan or project. You should explain the nature of the difficulty / upset, your proposed solution and how you went about implementing the solution. Your example may be drawn from your academic life or your work environment.

In my final year project I realised that my naïve implementation of the 2D Discrete Cosine Transform was very slow taking over 4 seconds to compute using a 256x256 image. I knew that this was unacceptable from a user perspective so I decided to investigate ways in which I could improve upon the implementation. Firstly I noticed that you could save a lot of repeated calculations by exploiting the fact that the two variables inside the cosine function were only ever in the range [0..7]. This meant that I could simply create an 8x8 cosine lookup table that was computed once when the applet was initialised and then the values were simply looked up when needed (this reduced the computation time for the DCT by a factor of 4.71 whilst adding a slight overhead to the start up time and memory demands but these turned out to be negligible). The second approach to solving this problem was to notice that the 2D DCT could actually be split into two 1D DCTs - one in each dimension. This theoretically reduced the computations required for an 8x8 block by a factor of 4 and in practice improved performance by a factor of 2.93 improvement. Thus by simply taking my implementation and working through it step by step, investigating and improving each part I could, I reduced the time taken for the 256x256 image to less than 300ms - an improvement factor of 14.3. This was the difference between project success and project failure - had I not found a solution, my user study would have likely shown a lot of frustration from users which could have dominated the findings and resulted in the other minor issues not being found.

4. Competencies (cont.)

Q3. Interpersonal Skills

Please provide an example of when you have influenced someone to change their viewpoint on an issue. You should outline the situation, explain the methods you used to put your viewpoint across, the barriers you encountered and how you overcame these. Your example may be drawn from your academic life or your work environment.

Last month I undertook a website for Kilcootry Crafts (www.kilcootrycrafts.co.uk). The client wanted a site that would allow potential customers to see the sort of products that he offered and he had seen a site produced entirely in Flash that he had liked. The client suggested that he would like something similar basing his decision entirely on the aesthetically pleasing nature of the site. Coming from a more technical perspective, I suggested that this was not the best approach for a dynamic site like his for a number of reasons. Firstly I explained that in general, when people search for content they want to find what they are looking for quickly and so when they visit a page the first thing they will do is try to determine whether the site is of relevance to them (probably making a decision within ten seconds). I demonstrated that the flash site he had preferred took several seconds to load before the animation began and then took a further ten seconds for the introductory animation to finish before any content could be judged. I showed that these type of sites are not search-engine friendly as the content is not used by the search engine and explained that this would mean that potential customers would not find his site when searching for names of the products he made. I also discussed the fact that it would be more difficult to expand the site in future. I explained that a non-flash site would be easier for him to maintain as I could create an administration section that would allow him to easily add and change the products on offer and keep the site looking up-to-date whereas with the flash site it would be more difficult to achieve the same functionality and he would not be able to change the look at all. I did suggest that an animation showing some products could be added as a compromise to make the site more appealing but that the navigation and content would all be done using standard web technologies. The client was persuaded by my arguments and the project is nearing completion.

Q4. Teamwork

Please provide an example of where you have worked as part of a team. You should outline the team's objectives, describe your role in the team, detail any difficulties / conflict / challenges that you encountered and outline your approach to resolving these. Your example may be drawn from your academic life or your work environment.

I could discuss a number of teams I have been involved in such as the second year group project at university, 'Synthetic Sudoku', or the challenges of making 50 litres of ice cream for a garden party when I was on the committee of the Emmanuel Real Ice Cream Society. Instead I will discuss when I was Chief Editor of Omagh Academy school magazine in 2003. The magazine is an annual publication of approximately 150 pages and is distributed freely to about 1000 people (including pupils). The magazine team had three committees - an advertising committee, a literary committee and a smaller editorial team. At the start of the year I proposed creating new positions called 'year group representatives' which appointed two pupils from each year group to liaise with the literary committee and editorial team to ensure that contributions from younger year groups would be included (this was because in previous years I had noticed that the junior school had been underrepresented)—these new posts turned out to be quite a successful idea. As Chief Editor I was responsible for ensuring all the committees meet their objectives so that the magazine would be ready on time. I also had the responsibility of ensuring that all the content was proof read and suitable for publishing. I added my own touch to the project by designing a new front cover to replace the existing cover that had been used for many years before (this had been tried in previous years but the teacher in charge had always refused) - a variation of my cover design has been used every year since. I also changed the layout of the magazine to give it a more professional look and designed the section title pages. The main difficulty was getting everyone to submit their work on time however the weekly meetings I organised helped to ensure that everyone was working progressively towards the final goal. The magazine was a success and I was asked to stay on the following year as an advisor for the centenary magazine and co-produced another publication: 'Omagh Academy Centenary Celebrations: A Pictorial Record'.

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Q1. Please outline any further formal training you have undertaken.

None

Q2. Please refer to the Project Specification for this post and demonstrate how you meet each of the essential experience and qualification requirements of the project and post.

Qualifications and Experience

1. I have a BA(Hons.) 2.1 degree in Computer Science from the University Of Cambridge

Personal Qualities and Skills

1. Through my second year group project, my work on the committee of ERICS (Emmanuel Real Ice Cream Society) and as Emmanuel College Yearbook Co-Editor, Deputy Head boy at Omagh Academy, an editor of 'Omagh Academy Centenary Celebrations: A Pictorial Record', Chief Editor of 'Omagh Academy School Magazine 2003', a pupil librarian at Omagh Academy, a member of a successful Paperclip Physics team and as a volunteer leader with First Omagh Boys' Brigade Anchor Boy Section I believe I have numerous examples to show that I can achieve results by working with and through others.

2. As a member of a 2003 Paperclip Physics team 'A Saucey Dilemma' I show that I have the ability to communicate effectively with people orally. The competition involved explaining a scientific principle using only household items to a non-scientist, a science teacher and a science expert and our team won the Belfast and Dublin heats to make it to the grand final in London by explaining why tomato ketchup doesn't come out of the bottle easily. Also as part of my group project I addressed a large audience of about 150 people and as part of my final year project I also had to give several smaller presentations to other students and academics. My dissertation is an example of how I can communicate with people effectively in writing.

3. I have shown in several places in this application that I can resolve problems effectively. I also regularly help people out with their technical problems over the phone or on-site.

4. I am a very motivated person and can pick things up easily on my own. This summer for example I have learned XHTML, CSS and I'm currently learning PHP and MySQL. Before starting university I had almost no experience in programming and so I had to pick things up quite quickly in my first year and this is a skill I have developed.

5. Through my posts and responsibilities listed above and described previously in this application form I have shown that I can work well as a member of a team.

6. I am a very committed person and always stick at the project until it is successfully completed.

5. Additional Information (cont.)

Length of Notice required by current employer?	Do you have any planned holidays? If yes, please provide dates.
None	No

Do you hold a full and current driving licence?	Yes ✓	No

Do you have any disability or long-term health condition which affects your day-to-day activity?	Yes ☐	No ✓

Please let us know if you require any reasonable adjustments, due to disability, to enable you to attend interview.

N/A

6. References

Please give the names and addresses of two referees, one of whom should be your current employer. Referees will not be contacted until a provisional offer is made.

Name	Dr. Neil A. Dodgson (Reader in Graphics & Imaging)		
Address	Office FS10, Computer Laboratory, William Gates Building, 15 JJ Thomson Avenue, Cambridge		E-mail: Neil.Dodgson@cl.cam.ac.uk
	Postcode CB3 0FD		
Tel. no. +44 (0)1223 334417		Fax no. (if possible) +44 (0)1223 334678	

Name	Mrs. Chris Gervais (Vice Principal)		
Address	Omagh Academy, 21-23 Dublin Road, Omagh, County Tyrone, Northern Ireland		E-mail: info@omaghacademy.omagh.ni.sch.uk
	Postcode BT78 1HF		
Tel. no. +44 (0)28 8224 2688		Fax no. (if possible) +44 (0)28 8224 6737	

The statements given by me on this application are to the best of my knowledge and belief true and accurate. I understand that deliberate falsification of factual information or wilful suppression of any material fact may prejudice my application.

Signature: *Davs Reel.*

Date: _25th September 2007_

We wish to analyse the advertising media used to attract applications for the FUSION Initiative. Please indicate below the medium by which you became informed about the FUSION programme.

Irish Independent	☐	
Belfast Telegraph	☐	
Other newspaper	☑	**Please note:** *Newsletter*
NIJobs Website	☐	
Irish.Jobs Website	☐	
GradIreland Website	☐	
Other website	☐	**Please note:**
College/University Careers Service	☐	
Friend/Colleague/Word of Mouth	☐	