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# Daviid Gauthier: A Portrait of the Engineer as Architect of Information

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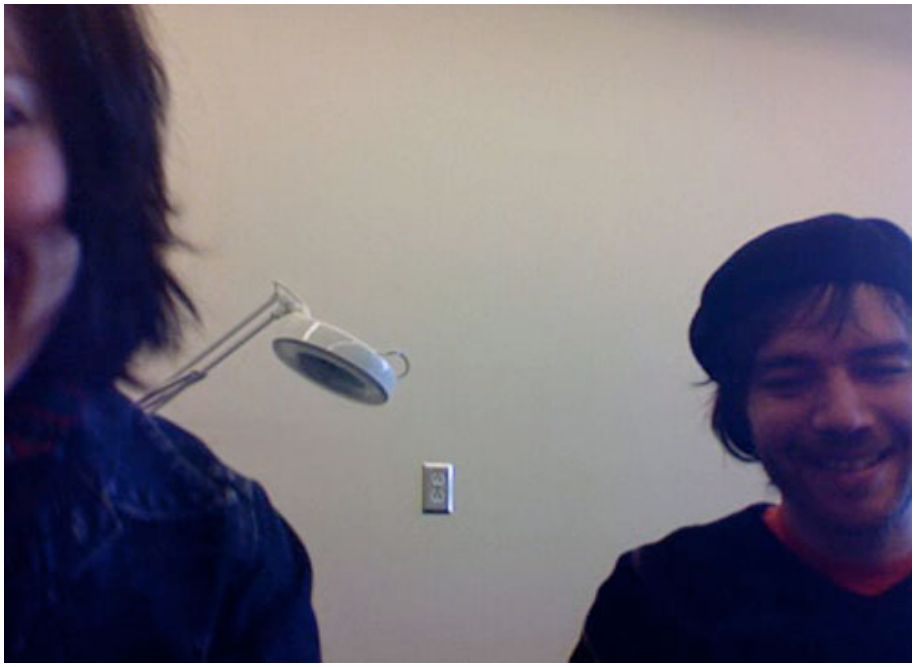

Daviid Gauthier is one of the lead engineers in the Mobile Digital Commons Network,[1] a collaborative research project involving Concordia University, the Banff New Media Institute, the Ontario College of Art and Design, and York University. As a researcher in the network, I have had the privilege and pleasure of working closely

[1] For more information on the Mobile Digital Commons Network (MDCN), please visit: http://www.mdcn.ca

with Gauthier in numerous circumstances, from technology tutorials to in situ testing. Gauthier has defied my ideas of the stereotypical computer engineer, which I have come to identify as a socially inept 20-something male, who sits in front of a computer terminal screen in a darkened room for fourteen hours a day. This is clearly a gross and inaccurate portrayal of a community of people; my point however, is that Gauthier, although involved with the quintessential tasks allocated to engineers, such as creating, testing and debugging code, transcends the role of computer engineer and in doing this transverses the art/humanities/sciences divide. Not only is he in synch with the creative ideas of the team, he assists us to refine our ideas to make it feasible from an engineering perspective, transforms it all into code, and makes it work with the technology. More than anything, Gauthier's transition from mathematician to engineer and to architect of information, which I will argue is his current role, is a tale of crossing disciplinary boundaries.

Recently, I had the opportunity to formally talk to Gauthier about his experiences with the Mobile Digital Commons Network. He discussed his role in MDCN, including the development of the Mobile Experience Engine and his burgeoning interest in pervasive and ubiquitous computing. Most importantly, what follows is a collaborative endeavour between Gauthier and myself; a testament to his belief that knowledge is a shared venture and requires that individuals contribute, not only in terms of one's specialization but also in terms of learning the specializations of others.

Gauthier started as a game developer during the first phase of the project, which concluded in May 2005. That September, Gauthier moved from the Banff New Media Institute to Hexgram (Concordia University), where he started working with Michael Longford on the

Interactive Parks project, as part of MDCN II. This resulted in *Urban Archaeology: Sampling the Park*.[2] Since then, he has worked as a lead engineer on MDCN II.

> Coming into MDCN I had no idea about the mobile world. My background is in math and computer science. I did an undergrad in math and I got really bored with it in the end. It's weird being a mathematician because you don't have loads of jobs but you have loads of opportunities. In job descriptions, it won't say, "we need a mathematician" it'll say, "we need an engineer".
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> Being from Montréal, I was interested in virtual reality. Montréal is big for that and 3-D gaming. So I started working in that area, and that is where I met Anita Johnston who was affiliated with the Banff New Media Institute (BNMI).[3] I did a project with her and Mike Pelletier that was a game mod for a virtual tournament called, *cuteXdoom*. This linked me to the Banff New Media Institute.
>
> There was an opening at BNMI for a developer with a science background and that is when I got involved with MDCN. During this time I worked closely with Tom Donaldson, Anita Johnston, Jeff Lillemon and Angus Leech. Back in those days we did a game called, *Mimetchi*[4] on the Hoodoo Trail in Banff National Park. It was at that point that Tom and I decided that if we were going to do some more iterations or prototype games, we needed a framework to rapidly prototype code. And that's why we started

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[2] http://www.digitalcitiesproject.net/arts/show_video.php?pid=51

[3] For more information on BNMI, please visit: http://banffcentre.ca/bnmi

[4] *Mimetchi* was a mobile fantasy game designed for young people. Players adopt animal identities and explore the wilderness along the Hoodoo trail in Banff National Park.

the first version of the MEE engine. We also worked a little bit with sensors back then.

More recently, Gauthier has been developing environmental and wearable sensors with Geoffrey Jones another engineer working Interactive Parks. As Gauthier explains:

> This past summer I worked with Geoffrey Jones on the electronic side of things and integrating that to communicate with mobile platforms. We built some beacons. We got the beacons working in The Haunting5 environment with the MEE engine. A beacon is a Bluetooth6 radio and a light. So this summer, our beacon was sniffing around and as long as it discovered a device in range, it blinked. It's really simple. For our next iteration, the beacon that we present at the end of MDCN II, the beacon will be discoverable but it won't sniff around for other devices. Instead, other devices will sniff around and find that beacon, connect to it and command the beacon to go on, go off, and blink fast or slow. So all the intelligence will move from the beacon to the phone. In that way, we can synchronize let's say, a sound to the phone and a blinking light.

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[5] The Haunting is an outdoor mobile game for Mont Royal park in Montréal. Players find and capture ghosts along park trail at night. Currently, it is in the final stages of prototyping and will be available for public demonstration at the end of March.

[6] Bluetooth technology is a short-range radio technology that allows the wireless networking of devices, which can be linked up to 10 meters, allowing data to be exchanged between mobile technologies (i.e. Mobile phones, PDAs, laptops). Data exchange does not require line-of-sight physicality; it transmits via frequencies in the range of 2.4 to 2.4835 GHz and achieves data rates of up to 721 kilobits per second. Bluetooth Special Interest Group, a consortium of computer and telecommunications companies founded in 1998 by Ericsson, IBM, Intel, Nokia and Toshiba it supports an open specification for wireless, short-range transmission between mobile PCs, mobile phones and other portable devices.

Generally, a beacon is sensor, meaning that it responds to stimuli, such as heat, light, or pressure and in turn produces a signal that can be measured or interpreted. The sensors that Gauthier and Jones are building are environmental sensors and will be placed in an outdoor space for mobile game experiences. The current iteration of sensors, what they refer to as 'beacons', will be placed in Mount Royal Park during the installation of The Haunting game. The beacons, which will be in situ, trigger content (animations, sound) on the phones. More specifically, as players approach range (roughly 10 meters), their phone discovers the beacon via Bluetooth, makes a connection and synchronizes content delivery. Even though Gauthier continues to work on the Mobile Experience Engine, his interests in sensors has introduced him to pervasive and ubiquitous computing. This form of computing focuses on embedding computational devices in the environment, thereby allowing individuals to interact with these devices that are out of sight.

However, prior to Gauthier's work with sensors, he was collaborating with lead engineer Tom Donaldson on the first iteration of the Mobile Experience Engine (MEE), a software development kit for creating advanced application and media-rich experiences on mobile devices (Donaldson 1), such as cell phones. While the MEE began as an internal engineering tool in MDCN I, it soon became an integral component of MDCN II. Moreover, while the MEE had worked fairly well during the course of MDCN I, Gauthier and Donaldson had learned its limitations as a system from working closely with the artists. This gave them insight into what improvements and adjustments to make and a year and a half to devote to it. It had since become the software development kit used by the Mobile Digital Commons Network.

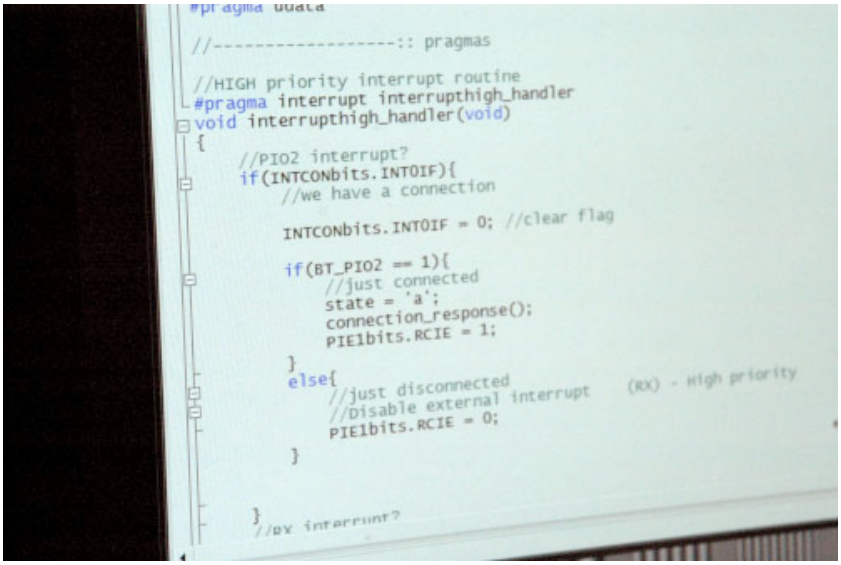
> We rewrote the software because we had in mind what the artists were demanding, like image, video, sound, so we built that framework a brand new framework and we rewrote the software. And it proved to be better than the first one. The first one we completed in two months, so now we had the time. I worked closely with Tom who was still in Banff and we drilled out some concepts and wrote the first bit of code. That winter we held workshops in Banff and tested out the engine. At that point it still needed debugging and we continued to debug throughout.

The Mobile Experience Engine was developed in part, as a response to the complicated state of the mobile platform world. Mobile platforms, such as cell phones and PDAs, run on as many as eight different operating systems. This means that mobile devices with similar attributes have widely differing capabilities and the capacity to streamline applications is complicated as the tools must be continuously re-designed. Therefore, as a software tool for generating code, the MEE creates a layer of code that can be compiled for different platforms. For instance, Gauthier inputs parameters (mathematical variables) for an interactive experience in XML[7] and the MEE generates an appropriate software application that can be installed on a particular mobile device and compiled for different mobile platforms. As Gauthier explains:

> In the mobile platform world there are so many operating systems. There's just too many of them, there's about eight of them. So

[7] Extensible Markup Language; defined by the World Wide Web Consortium (W3C) (2004b) as "a class of data objects called XML documents and partially describes the behavior of computer programs which process them. XML documents are made up of storage units called entities, which contain either parsed or unparsed data. Parsed data is made up of characters, some of which form character data, and some of which form markup. Markup encodes a description of the document's storage layout and logical structure. XML provides a mechanism to impose constraints on the storage layout and logical structure."

when you're building software for these mobile platforms you are continuously importing. So what happened with the MEE engine is that we isolated a bit of software, like the kernel bit or what needs to be overwritten to different platforms and once that is done, you can have the same XML inscription, like I said before the script, and it can be compiled for different platforms. So you write your XML once and you can produce code for different platforms. It's a layer of the software that can be rewritten for different platforms. So, lets say C++[8] runs on Windows and on Symbian[9], if you write that little layer of software for Windows and Symbian, well you can probably run some code in C++ that was written for the library and still runs on Symbian and Windows. It's a bit complicated really; it's software architecture.




[8] C++ is the primary Programming languages for computers of today. It is a programming language used for creating DOS, Windows, UNIX, etc. based programs (The C++ Programming Language by Bjarne Stroustrup).

[9] Symbian OS is an operating system with associated libraries, user interface frameworks and reference implementations of common tools, produced by Symbian Ltd. Symbian is the company created by Psion, Nokia, Ericsson and Motorola in 1998 with the aim of developing and standardizing an industry standard operating system for mobile multimedia terminals (EPOC) or wireless information devices.

The inception of the MEE was also inspired by a visit from researchers at Mobile Bristol,[10] a research centre founded by Hewlett Packard Laboratories,[11] the University of Bristol[12] and the Appliance Studio.[13] Mobile Bristol developed the Mediascape toolkit, authoring software that provides a "drop and drag" graphical user interface for attaching media files – such as sounds, text and image – to GPS coordinates. The authored experience can then be downloaded to a PDA (HP iPaq) and played back in real-time and space in conjunction with a GPS device and headset. Gauthier describes the differences between the Mobile Bristol toolkit and the MEE:

> The difference between Mobile Bristol and MDCN is that they were using iPaqs[14] and we had decided to move to the smart phones. Secondly, they were using flash.[15] And flash is a great thing for artists that already know it but what happened was that some artists became frustrated because it wasn't the flash that is normally on the PC. It's a light flash. It wasn't for gaming or media rich stuff, it was mainly for information delivery. Tom and I decided to write our own gaming libraries and link that to the MEE engine. The library is basically a scripting environment, like an XML based environment, where you produce a C++ or Java files and is then compile it to different platforms. So that is a brief comparison between the Mobile Bristol authoring system and the MEE engine.
>
> Mobile Bristol had HP behind them so their software is quite solid but it's not customizable and it's not open source.

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[10] For more information, please see: http://www.mobilebristol.co.uk/flash.html
[11] For more information, please see: http://www.hpl.hp.com/
[12] For more information, please see: http://www.bris.ac.uk/
[13] Please refer to http://aeon.stikipad.com/aeonresearch/show/HomePage
[14] The HP iPaq is a Personal Digital Assistant (PDA). A PDA is a portable computing device for organizing personal data such as telephone numbers, appointments, and notes and is capable of transmitting and receiving data when equipped with a wireless module. www.braddye.com/glossary.html
[15] Flash is animation software used to develop interactive graphics.

> For us it was clear that all the source code[16] was important. It was clear that people have access to the source code and in doing so we insure that our software is going to have a life and be customizable and easily adaptable to other platforms. Of course, we don't know. If you open source something, you know that the community at some point will help import the code to other devices so it can have a life

> That's how you learn doing software and even hardware is that you have access to open source projects so you can get state of the art code. If that isn't there, then how can you learn? You cannot learn from Windows because all the code is binary format, so you need projects like Linux or Apache because that's how you build a community of knowledge. And the software gets better and better that way. So this is why the MEE has advantages over other things out there. If we can put it outside of MDCN with a clear license, the network would benefit from it in the future. Open source ensures that it can have a life beyond MDCN.

Generally, there are three important characteristics of open source software: 1) the program source code is made available for use or modification to users or other developers; 2) it tends to be developed as a public collaboration and made freely available; and 3) it is, in principal, the antithesis of proprietary software. Yet as Gauthier notes, what is even more compelling about open sourcing the MEE is the possibility of building a community of knowledge. His interest in freeing technology from the confines of the lab is a testament to Gauthier the individual. He sees beyond his computer

[16] Source code is the code that a program consists of before the program is being compiled. It is a set of programming language instructions that must be translated to machine instructions before the program can run.

screen and is interested in the material implications and consequences of his work. Perhaps it is because of his subversive engineering spirit that has inspired me on a number of occasions to tell Gauthier that if he were a band, the critics would label him 'post-punk revival'.

In my opinion, Gauthier is not only a mathematician and engineer. He is an architect of information, a title Michael Truscello refers to in his response to Eric Raymond's Open Source software Manifesto, "The Cathedral and the Bazaar."[17] Specifically, Truscello marks a distinction between 'architects of information' and 'information architects', suggesting that the latter is an information technology sector moniker that is generously applied to software engineers (Truscello 2003). 'Architect of information' on the other hand, draws attention to the term 'architect', making explicit, what Truscello refers to as, "the discourse of the codification of space, both real and virtual" (Truscello 2003). As an architect of information, Gauthier is driven by a sincere belief and interest in challenging the limits of technological infrastructures and in turn, creates software and hardware that support information sharing and communities of knowledge.

All MDCN II related work will be showcased at, Mobile Nation: Creating Methodologies for Mobile Platforms, an international conference of experts on research, design and engineering for mobile experiences, March 22 - 25, 2007 at The Ontario College of Art and Design in Toronto.

[17] http://catb.org/~esr/writings/cathedral-bazaar/

## References

Donaldson, Tom. (2006). Introduction to MEE: The mobile experience engine.

Truscello, Michael. (2003). The architecture of information: Open source software and tactical poststructuralist anarchism. *Postmodern Culture*, 13 (3).

World Wide Web Consortium. (2004). Extensible markup language (XML) 1.0. (Third Edition). *W3C.org.*

Raymond, Eric. (2000). The cathedral and the bazaar. *Eric S. Raymond's Home Page*.

## Biography

**Andrea Zeffiro** is a Ph.D. candidate in Communication Studies at Concordia University, Montréal. She is a research assistant with Evaluation, Mobility and Usability (EMU), the evaluation arm of the Mobile Digital Commons Network (MDCN), and a research consultant for Digital Cities and Interactive Parks (MDCN). Her research considers the cultural meanings and political significance of locative media and seeks to intervene in debates concerning the political direction of new media theory and practice.

After earning a degree in Mathematics from the Université du Québec a Montréal, **Daviid Gauthier** joined the Banff New Media Institute where he created innovative technologies in the field of wearable and mobile computing. Now in Montréal, he is pursuing his research at the Hexagram Institute as a Research Associate within the Mobile Digital Commons Network and actively collaborates with various research labs such as XSLabs, Topological Media Lab,

IDMIL, Interstices Research Group and BASH. Wherever he works, Gauthier uses his scientific knowledge to shed light in the direction of media arts. Interested in mixing pattern cutting technics with Kalman filters, Gauthier hopes of one day creating an intelligent tuxedo.