

**FORM 100**
Personal Data Form
PART I

Date

2013/06/17

Family name Nowrouzezahrai	Given name Derek	Initial(s) of all given names D	Personal identification no. (PIN) 320797
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☐ I hold a faculty position at an eligible Canadian college
(complete Appendices B1 and C)☐ I do not or will not hold an academic appointment at a
Canadian postsecondary institutionPlace of employment other than a Canadian postsecondary
Institution (give address in Appendix A)**APPOINTMENT AT A POSTSECONDARY INSTITUTION**

Title of position Assistant Professor	Tenured or tenure-track academic appointment	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Department Informatique et recherche opérationnelle	Part-time appointment <input type="checkbox"/>	Full-time appointment <input checked="" type="checkbox"/>
Campus	<ul style="list-style-type: none">For all non-tenured or non tenure-track academic appointment and Emeritus Professors, complete Appendices B & CFor life-time Emeritus Professor and part-time positions, complete Appendix C	
Canadian postsecondary institution Montréal		

ACADEMIC BACKGROUND

Degree	Name of discipline	Institution	Country	Date yyyy/mm
Bachelor's	Computer Engineering	Waterloo	CANADA	2005 / 5
Master's	Computer Science	Toronto	CANADA	2006 / 10
Doctorate	Computer Science	Toronto	CANADA	2010 / 9
Postdoc	Computer Science	Disney Research Zurich	SWITZERLAND	2011 / 12

TRAINING OF HIGHLY QUALIFIED PERSONNEL

Indicate the number of students, fellows and other research personnel that you:

	Currently		Over the past six years (excluding the current year)		Total
	Supervised	Co-supervised	Supervised	Co-supervised	
Undergraduate			2	3	5
Master's	3			10	13
Doctoral	1	1			2
Postdoctoral	1				1
Others	1		1	2	4
Total	6	1	3	15	25

Personal identification no. (PIN)

320797

Family name

Nowrouzezahrai

ACADEMIC, RESEARCH AND INDUSTRIAL EXPERIENCE (use one additional page if necessary)

Position held (begin with current)	Organization	Department	Period (yyyy/mm to yyyy/mm)
Assistant Professor	Montréal	Informatique et recherche opérationnelle	2012/01
Postdoctoral Researcher	The Walt Disney Company (Schweiz) GmbH	Disney Research Zurich	2010/09 to 2011/12
Research Intern	The Walt Disney Company (Schweiz) GmbH	Disney Research Zurich	2009/07 to 2009/10
Research Intern	Microsoft Research	Computer Graphics Research Group	2007/12 to 2008/04
Program Manager	Microsoft Corporation	Mobile Devices and Mobile Media Platform	2006/10 to 2006/12
Program Manager	Microsoft Corporation	Mobile Devices	2005/05 to 2005/08
Software Engineer	Electronic Arts Canada	Ignition Rendering Team	2004/09 to 2004/12
Software Design Engineer	Amazon.com	Software Platform Services	2003/09 to 2003/12
Embedded Systems Software Developer	Research in Motion	Operating Systems Group	2003/01 to 2003/05
Software Developer	Research in Motion	Infrastructure Services	2002/06 to 2002/09

Personal identification no. (PIN)

320797

Family name

Nowrouzezahrai

ACADEMIC, RESEARCH AND INDUSTRIAL EXPERIENCE (use one additional page if necessary)

Position held (begin with current)	Organization	Department	Period (yyyy/mm to yyyy/mm)
Software Developer	Research in Motion	Infrastructure Services	2001/09 to 2001/12
Software Developer	Research in Motion	Infrastructure Services	2001/07 to 2001/05

Personal identification no. (PIN)	Family name
320797	Nowrouzezahrai

RESEARCH SUPPORT

Family name and initial(s) of applicant	Title of proposal, funding source and program, and time commitment (hours/month)	Amount per year	Years of tenure (yyyy)
List all sources of support (including NSERC grants and university start-up funds) held as an applicant or a co-applicant: a) support held in the past four (4) years but now completed; b) support currently held, and c) support applied for. For group grants, indicate the percentage of the funding directly applicable to your research. Use additional pages as required.			
b) Support currently held			
Derek Nowrouzezahrai	N/A	7,500	2012
	University Start-up Funds	7,500	2013
	Computer Science - Computer Graphics		
Derek Nowrouzezahrai	Theoretical Analysis and User-oriented Controls	33,000	2012
	of Image Synthesis and Animation	33,000	2013
	NSERC	33,000	2014
	Discovery Grant	33,000	2015
	85 hours/month	33,000	2016
Derek Nowrouzezahrai	Realistic and High Performance Rendering	94,000	2013
	MITACS		
	Accelerate Cluster		
Derek Nowrouzezahrai	Capture et manipulation de la réalité avec des caméras conventionnelles et des caméras augmentées	33,215	2013
	Fonds québécois de la recherche sur la nature et les technol	20,000	2014
	Nouveau chercheur (New Researcher)		
	30 hours/month		

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Nowrouzezahrai

RESEARCH SUPPORT

Family name and initial(s) of applicant	Title of proposal, funding source and program, and time commitment (hours/month)	Amount per year	Years of tenure (yyyy)
List all sources of support (including NSERC grants and university start-up funds) held as an applicant or a co-applicant: a) support held in the past four (4) years but now completed; b) support currently held, and c) support applied for. For group grants, indicate the percentage of the funding directly applicable to your research. Use additional pages as required.			
b) Support currently held Derek Nowrouzezahrai	PROMO project network investigator GRAND NCE Network Investigator 20 hours/month	12,000	2013

Highly Qualified Personnel (HQP)

Provide personal data about the HQP that you currently, or over the past six years, have supervised or co-supervised.

			Personal identification no. (PIN) 320797	Family name Nowrouzezahrai
Name	Type of HQP Training and Status	Years Supervised or Co-supervised	Title of Project or Thesis	Present Position
(Name withheld)	Doctoral (In Progress)	Supervised 2013 -	Realistic Height Field Shading	Doctoral Student
(Name withheld)	Master's (In Progress)	Supervised 2013 -	Models for Realistic and High-Performance Rendering	Master's Student
(Name withheld)	Master's (In Progress)	Supervised 2013 -	Interactive Screen-Space Rendering Techniques	Master's Student
(Name withheld)	Postdoctoral (In Progress)	Supervised 2013 -	Factorization techniques for BRDFs	Postdoctoral Researcher
(Name withheld)	Doctoral (In Progress)	Co-supervised 2013 -	Machine Learning Techniques in Realistic Rendering	Doctoral Student
(Name withheld)	Master's (In Progress)	Supervised 2012 -	Practical Fourier Adaptive Sampling	Master's Student
(Name withheld)	Research Intern (In Progress)	Supervised 2012 -	Realistic upsampling for interactive and accurate rendering	Research Intern
(Name withheld)	Undergraduate (Completed)	Supervised 2013 - 2013	Interactive Global Illumination	Master's Candidate
(Name withheld)	Undergraduate (Completed)	Supervised 2012 - 2013	Realistic Fluid Simulation and Instant Radiosity	Master's Candidate
(Name withheld)	Research Intern (Completed)	Supervised 2012 - 2013	Path-Space Manipulation of Physically-Based Light Transport	Doctoral Student - Karlsruhe Institute of Technology
Houit, Thomas	Master's (Completed)	Co-supervised 2011 - 2012	Goal-Based Steganography	Master Student - Swiss Federal Institute of Technology
Keller, Philipp	Master's (Completed)	Co-supervised 2011 - 2012	Manufacturing Shadows	Master Student - Swiss Federal Institute of Technology
Millius, Sebastian	Master's (Completed)	Co-supervised 2011 - 2012	Irradiance Caching for Diffusion Curves	Master Student - Swiss Federal Institute of Technology
Siegrist, Thomas	Master's (Completed)	Co-supervised 2011 - 2012	Stereographics BRDF	Master Student - Swiss Federal Institute of Technology
Spaeni, Marina	Master's (Completed)	Co-supervised 2011 - 2012	Parameterized Radiance Volumes	Master Student - Swiss Federal Institute of Technology
Blumer, Adrian	Undergraduate (Completed)	Co-supervised 2011 - 2011	Visibility Silhouette Level-of-Detail	Software Developer - Cyfex AG
(Name withheld)	Undergraduate (Not Completed)	Co-supervised 2011 - 2011	Investigation of normal map filtering for image synthesis	Bachelor Student - Swiss Federal Institute of Technology
Millius, Sebastian	Undergraduate (Completed)	Co-supervised 2011 - 2011	Fabrication method analysis of Goal-Based Caustics Surfaces	Master Student - Swiss Federal Institute of Technology
Morandi, Michael	Master's (Completed)	Co-supervised 2011 - 2011	Directional Occlusion Volumes	Master Student - Swiss Federal Institute of Technology
Muhki, Rahul	Research Intern (Completed)	Co-supervised 2011 - 2011	Data-Driven Shading	Master Student - University of Zurich

Highly Qualified Personnel (HQP)

Provide personal data about the HQP that you currently, or over the past six years, have supervised or co-supervised.

			Personal identification no. (PIN) 320797	Family name Nowrouzezahrai
Name	Type of HQP Training and Status	Years Supervised or Co-supervised	Title of Project or Thesis	Present Position
Novak, Jan	Research Intern (Completed)	Co-supervised 2011 - 2011	Virtual Beam Lights for Participating Media	PhD Student - Karlsruher Institut fuer Technologie
Simmler, Philipp	Master's (Completed)	Co-supervised 2011 - 2011	Overcoat Lighting	Master Student - Swiss Federal Institute of Technology
Tschopp, Silvan	Master's (Completed)	Co-supervised 2011 - 2011	Facial Performance Appearance Capture and Rendering	Recent graduate. Entering local computer science workforce.
Geiger, Stefan	Master's (Completed)	Co-supervised 2010 - 2011	An Immersive 3D Augmented Reality Lens	Co-founder, GIANTS Software GmbH
Mueller, Benjamin	Master's (Completed)	Co-supervised 2010 - 2011	Analytic Lighting in the Presence of Participating Media	Software Engineer, Siemens Schweiz AG

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Personal information collected on this form and appendices will be stored in the Personal Information Bank for the appropriate program.

Version française disponible



PROTECTED WHEN COMPLETED

Contributions

1. Most Significant Contributions to Research and/or to Practical Applications

My significant works discussed below comprise **21** papers (**9** in the **Transactions on Graphics / SIGGRAPH / SIGGRAPH Asia**) and **5** filed patents, accounting for nearly half of my publication record.

I. Photon Beams and Path-Space Clustering for Physically-Accurate and Art-Directable Shading

At Disney Research Zurich, my colleagues and I introduced a novel lighting primitive for scattering in participating media, such as smoke and fog. These *photon beams* are based on a theory of density estimation that we also pioneered. At the University of Montreal, along with colleagues at Karlsruhe Institute of Technology, we developed related path-clustering techniques for physically-based light editing.

This work resulted in 5 publications in ACM Transactions on Graphics, the top CG journal [1, 6, 10, 14], presented at the top CG conferences (SIGGRAPH / SIGGRAPH Asia), and 3 patents [35,37,38].

The first photon beams work [14] unifies and generalizes volumetric radiance estimation, enveloping all previous works in CG as special cases of our general theory in addition to presenting several new, more robust, efficient and accurate radiance estimates. Our follow-up work addresses art-directable shading, and extends our theory to support progressive radiance estimation for ground truth computations [6,10] and surface shading [1]. Despite their infancy, photon beams have been adopted in industry: Disney Animation Studios use beams in *Tangled* they have also been integrated into Pixar's RenderMan tool.

I co-developed both the initial and progressive radiance estimation theories, and programmed the software that implements all the techniques. I helped with all experimental validations and paper writing.

II. Hierarchical Occlusion and Incident Light Sampling for Real-Time Rendering of Animated Scenes

With colleagues at Microsoft Research, I developed several real-time global-illumination algorithms. The first project, *image-based accumulation* (IMACC), computed shadows and coarse indirect light for animated characters. Two following works address the same effects, but on dynamic *height fields* (HF).

This work yielded 3 publications [21, 24, 31], 2 at the top rendering venue, and 2 filed patents [40, 41].

IMACC is the first work to use *bilateral signal-aware upsampling* for real-time shading [31], with over 35 citations in under 4 years. Our HF work has prompted independent follow-up works in what is growing into a niche rendering sub-field. We released our HF code to promote adoption and experimentation. In the seminal HF work [24], I implemented and validated the technique that my colleague Dr. Snyder formulated. I developed the mathematical model and led all implementation of our follow-up work [21]. For IMACC, I performed experimental validation and developed indirect light solutions.

III. Data-Driven Bases and Models for Real-Time Shading of Dynamic Scenes

My largest body of work uses data-driven models and machine learning to compute shadows on static and animated objects in real-world lighting. The latest *modular radiance transfer* (MRT) work is a novel precomputed lighting tool for interactive design that computes lighting in dynamically generated scenes.

This work yielded 6 publications [10, 11, 22, 27, 29, 30] including 1 at SIGGRAPH Asia, 1 at Eurographics (the top European venue), and a Best Paper winning manuscript.

My work on data-driven shading from environment maps [22,27,29,30] is well-received in the academic and industrial communities, is incorporated into at least one commercial game engine, and has motivated follow-up work outside rendering (see [7,23]). MRT represents a fundamental re-thinking of precomputed lighting and it has already been integrated into art-generation pipelines of a game studio [10, 11].

For the 4 projects addressing shadows from real-world lighting, I was the principal researcher, driving all major mathematical modeling, experimental analysis, validation, software implementation, and writing. In these cases, my colleagues provided targeted support on machine learning topics, data-capture and processing, result generation, and error analysis. For the MRT projects, my contributions include co-development of the mathematical and theoretical frameworks, software development, and paper writing.

IV. Data-Driven Geometry Processing for Surface Reconstruction and Non-Photorealistic Rendering

I collaborated with colleagues at the University of Toronto on a novel, robust surface curvature estimator. Computing continuous curvature on discrete surfaces has many applications, notably in non-photorealistic rendering (NPR) of line drawings of 3D objects. We combined our curvature approach with data-driven models to synthesize line drawings of high-quality *animated meshes*. We also designed a system capable of taking hand-sketched line drawings and generating drawings of arbitrary scenes *in the same style*: the first attempt at an “art learning machine”. I also worked on a system for reconstructing dense leafy foliage using off-the-shelf digital cameras with colleagues at Disney Research Zurich.

This work resulted in 5 publications [2, 7, 20, 23, 28]: 3 in ACM Transactions on Graphics (presented at SIGGRAPH), 1 in CG’s top geometry venue, and 1 in a top geometry processing journal (CAD).

Our robust estimator is among the state-of-the-art in CG [20, 28]. Our animated line drawing approach is the only work to-date to support real-time high-quality line drawing for animated meshes [23]. Lastly, our artistic style transfer method is the first work to use real artist input to drive simulated drawings [7].

On these projects, I co-developed theoretical models, implemented software prototypes, conducted validation experiments, and helped with writing. The last two projects were motivated by my data-driven work in *realistic* rendering, building on and extending the techniques and methodologies I developed.

V. Direct Manipulation for Intuitive and Interactive Video Navigation

I developed a *direct-manipulation video player* (DIMP) with colleagues at the University of Toronto. We addressed shortcomings of standard video players: traditional linear time navigation (e.g., a *time slider* interface) is restrictive; we allow users to select and drag “video objects” along their *motion paths*.

DIMP was published in the top HCI venue [25] (ACM SIGCHI) and we released the player online, garnering significant media attention from notable online news outlets (e.g. Digg, Slashdot, Techcrunch).

DIMP combines HCI, computer vision, and signal-processing. I led the signal-processing component, developing sampling approaches for path-based navigation, as well as handling computer vision issues.

2. Research Contributions and Practical Applications

Articles in Refereed Publications

1. **T.-W. Schmidt, J. Novak**, J. Meng, A. Kaplanyan, T. Reiner, D. Nowrouzezahrai, C. Dachsbacher. *Path-Space Manipulation of Physically-Based Light Transport*. ACM Transactions on Graphics, 32(4) – SIGGRAPH 2013. UM.
2. D. Bradley, D. Nowrouzezahrai, P. Beardsley. *Image-Based Reconstruction and Synthesis of Dense Foliage*. ACM Transactions on Graphics, 32(4) – SIGGRAPH 2013. UM, (DRZ)
3. E. Heitz, D. Nowrouzezahrai, P. Poulin, F. Neyret. *Filtering Color Mapped Textures and Surfaces*. ACM Symposium on Interactive 3D Graphics 2012 – Best Paper Award Winner. UM, (NSERC)
4. M. Papas, **T. Houit**, D. Nowrouzezahrai, M. Gross, W. Jarosz. *The Magic Lens: Refractive Steganography*. ACM Transactions on Graphics, 31:6 – SIGGRAPH Asia 2012. UM, (DRZ)
5. **J. Novak**, D. Nowrouzezahrai, C. Dachsbacher, W. Jarosz. *Progressive Virtual Beam Lights*. Computer Graphics Forum, 31:4 – Proceedings of the Symposium on Rendering 2012. UM, (NSERC)
6. **J. Novak**, D. Nowrouzezahrai, C. Dachsbacher, W. Jarosz. *Virtual Ray Lights for Rendering Scenes with Participating Media*. ACM Transactions on Graphics, 31:4 – SIGGRAPH 2012. UM, (NSERC)
7. E. Kalogerakis, D. Nowrouzezahrai, S. Breslav, A. Hertzmann. *Learning Pen-and-Ink Hatching of Surfaces*. ACM Transactions on Graphics 2011, 31(1). UT, (NSERC)
8. D. Nowrouzezahrai, P. Simari, E. Fiume. *Sparse Zonal Harmonic Factorization for Efficient SH Rotation and Shading*. ACM Transactions on Graphics – Presented at SIGGRAPH 2012. DRZ, (UT)
9. W. Jarosz, D. Nowrouzezahrai, R. Thomas, P. Sloan, M. Zwicker. *Progressive Photon Beams*. ACM Transactions on Graphics, 30 (6) –SIGGRAPH Asia 2011. (DRZ)
10. B. Loos, L. Antani, K. Mitchell, D. Nowrouzezahrai, W. Jarosz, P. Sloan. *Modular Radiance Transfer*. ACM Transactions on Graphics, 30 (1) –SIGGRAPH Asia 2011. (DRZ)
11. B. Loos, D. Nowrouzezahrai, W. Jarosz, P. Sloan. *Delta Radiance Transfer*. ACM Symposium on Interactive 3D Graphics 2012 (DRZ)
12. I. Baran, D. Nowrouzezahrai, **P. Keller**, D. Bradley, S. Coros, W. Jarosz, M. Gross. *Multilayer Attenuators for Multiple Prescribed Shadow Images*. Eurographics 2011. (DRZ)
13. R. Ramamoorthi, J. Anderson, M. Meyer, D. Nowrouzezahrai. *A Theory of Monte-Carlo Visibility Sampling*. ACM Transactions on Graphics 2011 – Presented at SIGGRAPH 2012. PIXAR, (DRZ)
14. D. Nowrouzezahrai, J. Johnson, A. Selle, D. Lacewell, M. Kaschak, W. Jarosz. *A Programmable System for Artistic Volumetric Lighting*. Transactions on Graphics, 30(4) – SIGGRAPH 2011. (DRZ)
15. H. Yuan, D. Nowrouzezahrai, P. Sloan. *Irradiance Rigs*. J. of Graphics Tools 2011. (DRZ)
16. P. Sloan, D. Nowrouzezahrai, H. Yuan. *Wrap Shading*. J. of Graphics Tools 2011. (DRZ)
17. W. Jarosz, D. Nowrouzezahrai, I. Sadeghi, H. Wann Jensen. *A Comprehensive Theory of Volumetric Radiance Estimation using Photon Points and Beams*. ACM Transactions on Graphics, 30 (1), p. 5:1 - 19 – presented at SIGGRAPH 2011. (DRZ)
18. D. Nowrouzezahrai, **S. Geiger**, K. Mitchell, R. Sumner, W. Jarosz, M. Gross. *Light Factorization for Mixed-Frequency Shadows in Augmented Reality*. IEEE Symp. Mixed & AR 2011. ETH, (DRZ)
19. J. Baar, S. Poulakos, W. Jarosz, D. Nowrouzezahrai, R. Tamstorf, M. Gross. *Perceptually-Based Compensation of Light Pollution in Display Systems*. Symposium on Applied Perception in Graphics and Visualization 2011. ETH, (DRZ)

20. E. Kalogerakis, D. Nowrouzezahrai, P. Simari, K. Singh. *Extracting Lines of Curvature from Noisy Point Clouds*. Elsevier Journal of Computer-Aided Design 41 (4), p. 282 - 292, 2009. UT, (NSERC)
21. D. Nowrouzezahrai, J. Snyder. *Fast Global-Illumination on Dynamic Height Fields*. Computer Graphics Forum 28 (4), p. 1131 - 1139. Proceedings of the Symposium on Rendering 2009. (UT)
22. D. Nowrouzezahrai, E. Kalogerakis, E. Fiume. *Shadowing Dynamic Scenes with Arbitrary BRDFs*. Computer Graphics Forum 28 (2), p. 249 - 258. Proc. Eurographics 2009. UT, MITACS, (NSERC)
23. E. Kalogerakis, D. Nowrouzezahrai, P. Simari, J. McCrae, A. Hertzmann, K. Singh. *Data-driven curvature for real-time line drawing of dynamic scenes*. ACM Transactions on Graphics 28 (1), p.11:1 – 13 - Presented at SIGGRAPH 2008. UT, MITACS, (NSERC)
24. J. Snyder, D. Nowrouzezahrai. *Fast Self-Shadowing on Dynamic Height Fields*. Computer Graphics Forum 27 (4), p. 1275 – 1283. Proceedings of the Symposium on Rendering 2008. (MSR)
25. P. Dragicevic, G. Ramos, J. Bibliowicz, D. Nowrouzezahrai, R. Balakrishnan, K. Singh. *Video Browsing by Direct Manipulation*. Proceedings of ACM SIGCHI 2008, p. 237 - 246. UT, (MITACS)
26. P. Simari, D. Nowrouzezahrai, E. Kalogerakis, K. Singh. *Multi-Objective Shape Segmentation & Labelling*. Computer Graphics Forum 28(5) p.1415-1425. Symp. on Geom Proc. 2008. UT, (MITACS)
27. D. Nowrouzezahrai, E. Kalogerakis, P. Simari, E. Fiume. *Shadowed Relighting of Dynamic Geometry with 1D BRDFs*. Proceedings of Eurographics 2008 Short Papers. UT, (NSERC)
28. E. Kalogerakis, P. Simari, D. Nowrouzezahrai, K. Singh. *Robust statistical estimation of curvature on discretized surfaces*. Eurographics Symp. on Geometry Processing 2007, p.13-22. UT, (MITACS)
29. D. Nowrouzezahrai, P. Simari, E. Kalogerakis, E. Fiume. *Eigentransport for Efficient and Accurate All-Frequency Relighting*. Graphite 2007 – Best Paper Award Winner. UT, (NSERC)
30. D. Nowrouzezahrai, P. Simari, E. Kalogerakis, K. Singh, E. Fiume. *Compact and Efficient Generation of Radiance Transfer for Dynamically Articulated Characters*. Graphite 2007. UT, (NSERC)
31. P. Sloan, N. Govindaraju, D. Nowrouzezahrai, J. Snyder. *Image-Based Proxy Accumulation for Real-Time Soft Global Illumination*. Proceedings of Pacific Graphics 2007. (MSR)

Other Refereed Contributions

32. B. Loos, L. Antani, K. Mitchell, D. Nowrouzezahrai, W. Jarosz, P. Sloan. *Run-Time Implementation of Modular Radiance Transfer*. SIGGRAPH Talk Session 2011. (DRZ)
33. H. Yuan, D. Nowrouzezahrai, P. Sloan. *Irradiance Rigs*. SIGGRAPH Talk Session 2010. (DRZ)

Non-Refereed Contributions

34. D. Nowrouzezahrai, C. Gonterman. *Solving Radiance Transport as a Differential Equation*. University of Toronto Technical Report CSRG-588. 2008. UT, (NSERC)

Patents

35. D. Nowrouzezahrai, J. Johnson, A. Selle, D. Lacewell, M. Kaschalk, W. Jarosz. *A Programmable System for Artistic Volumetric Lighting*. P064210. USA. Filed 2011. (DRZ)
36. D. Nowrouzezahrai, I. Baran, W. Jarosz. *Visibility Silhouettes*. P069010. USA. Filed 2011. (DRZ)
37. W. Jarosz, D. Nowrouzezahrai, R. Thomas, P. Sloan, M. Zwicker. *Progressive Photon Beams*. P064010. USA. Filed 2011. (DRZ)
38. W. Jarosz, D. Nowrouzezahrai, P. Sloan. *Progressive Deep Shadow Map*. In preparation. (DRZ).

39. W. Jarosz, D. Nowrouzezahrai, S. Watson. *Compensation for Self-Scattering on Concave Screens*. Filed. Docket #027926-300600. USA. Filed 2009. (DRZ)
40. J. Snyder, D. Nowrouzezahrai. *Soft Shadows on Height Fields*. #323502.01. USA. Filed 2008.(MSR)
41. P. Sloan, N. Govindaraju, D. Nowrouzezahrai, J. Snyder. *Image-Based Proxy Accumulation for Real-Time Soft Global Illumination*. MS #320971.01. USA. Filed 2007. (MSR)

Abbreviations UW, UT, UM, MSR, DRZ refer to the Universities of Waterloo, Toronto and Montreal, Microsoft Research, and Disney Research Zurich. Author order typically dictates contribution level, with an exception for last-authorship, typically used to denote core research contribution.

For student authors, I applied the same guidelines. Publication venues are chosen depending on whether the work addresses a focussed sub-area (in which we target top-tier Eurographics Symposia), or whether the work may impact the entire CG community (then, SIGGRAPH/TOG and Eurographics are targeted). We sometimes target smaller venues to avoid delays in follow-up work. Many of my works have made significant and meaningful industrial impact, such as use in feature-film productions, integration into commercial rendering systems and interactive entertainment products, and application in theme parks.

3. Other Evidence of Impact and Contributions

I was an *International Program Committee Member* for SIGGRAPH Asia in 2012 and 2013, Eurographics' Symposium on Rendering (EGSR) in 2011 and 2013, High-Performance Graphics 2012 and Pacific Graphic 2013, and am a reviewer for many top-tier venues (e.g. SIGGRAPH, TOG, EG). My *Eigentransport* and *Filtering Appearance* works won Best Paper Awards and I won the Best Speaker Award at UT's 2010 Symposium on Trends in Computing. In 2009, I consulted for DRZ. Seven of my works are featured on proceeding cover pages and/or Preview Videos of SIGGRAPH, SIGGRAPH Asia, and EGSR. Outside of conference talks, I have been invited to speak at 11 universities and institutes.

4. Delays in Research Activity

2005 - 2011: I periodically interned at Microsoft, Microsoft Research, and DRZ for a total of 16 months.

5. Contributions to the Training of Highly Qualified Personnel (HQP)

While completing my Post-Doc at DRZ, I supervised undergraduate, graduate and intern students, and I taught graduate courses. DRZ is affiliated with the Swiss Federal Institute of Technology (ETH Zurich). Dr. Gross leads CG research groups at both institutions. In some cases, Dr. Gross is the *advisor* and I hold *supervisor* status. Since Oct. 2010 I graduated **9 MSc**, **4 BSc**, and **5 intern** students. I currently supervise **7 students: 3 MSc, 1 PhD, 1 Post-Doc, 1 co-supervised PhD and 1 intern**. Six of my students' projects have resulted in publication, with several projects in preparation for publication.

ETH's MSc program required that students complete all course work before choosing their *supervisor* and thesis topic. Here the *advisor/supervisor* distinction becomes clearer: the *advisor* (Dr. Gross) was chosen prior to course work according to the student's *research track* (e.g. Visual Computing). After course work the students choose their *supervisor*, who develops and supervises the thesis projects (with a strict 6 month deadline). University of Montreal students have no fixed time limit, with MSc theses typically taking around 2 years, and PhD theses between 4 and 6 years on average.



**SEND ONE
ORIGINAL ONLY
DO NOT
PHOTOCOPY**

**APPENDIX A
Personal Data
(Form 100)**

Complete this appendix (i) if you are an applicant or co-applicant applying for the first time; (ii) if you need to update information submitted with a previous application; or (iii) if you do not hold an appointment at a Canadian postsecondary institution. For updates, include only the revised information in addition to the date, your name and your PIN.

This information will be used by NSERC primarily to contact applicants and award holders. It may also be used to identify prospective reviewers and committee members, and to generate statistics. It will not be seen or used in the adjudication process.

Date 2013/06/17			
Family name Nowrouzezahrai	Given name Derek	Initial(s) of all given names D	Personal identification no. (PIN) 320797
Position and complete mailing address if your primary place of employment is not a Canadian postsecondary institution or if your current mailing address is temporary			If address is temporary, indicate: Starting date Leaving date
Telephone number 1 (905) 4699647	Facsimile number	E-mail address derek@iro.umontreal.ca	
Telephone number (alternate)	Give an alternate telephone number only if you can be reached at that number during business hours.		Gender (completion optional) <input checked="" type="checkbox"/> Male <input type="checkbox"/> Female
LANGUAGE CAPABILITY			
English	Read <input checked="" type="checkbox"/>	Write <input checked="" type="checkbox"/>	Speak <input checked="" type="checkbox"/>
French	Read <input checked="" type="checkbox"/>	Write <input checked="" type="checkbox"/>	Speak <input checked="" type="checkbox"/>
I wish to receive my correspondence:		in English <input checked="" type="checkbox"/>	in French <input type="checkbox"/>
AREA(S) OF EXPERTISE			
Provide a maximum of 10 key words that describe your area(s) of expertise. Use commas to separate them. If you have expertise with particular instruments and techniques, specify which one(s). Realistic Image Synthesis, Three Dimensional Computer Graphics, Computer Vision, Signal Processing, Parallel Computing, Machine Learning, Computer Animation, Applied & Theoretical Light Transport, Facial Performance Capture & Relighting, Digital Media & Interactive Techniques			Research subject code(s) Primary 2707 Secondary 2704



Appendix D (Form 100) Consent to Provide Limited Personal Information About Highly Qualified Personnel (HQP) to NSERC

NSERC applicants are required to describe their contributions to the training or supervision of highly qualified personnel (HQP) by providing certain details about the individuals they have trained or supervised during the six years prior to their current application. HQP information must be entered on the Personal Data Form (Form 100). This information includes the trainee's name, type of HQP training (e.g., undergraduate, master's, technical etc.) and status (completed, in-progress, incomplete), years supervised or co-supervised, title of the project or thesis, and the individual's present position.

Based on the federal *Privacy Act* rules governing the collection of personal information, applicants are asked to obtain consent from the individuals they have supervised before providing personal data about them to NSERC. In seeking this consent, the NSERC applicant must inform these individuals what data will be supplied, and assure them that it will only be used by NSERC for the purpose of assessing the applicant's contribution to HQP training. To reduce seeking consent for multiple applications, applicants will only need to seek consent one time for a six-year period. If the trainee provides consent by e-mail, the response must include confirmation that they have read and agree to the text of the consent form.

When consent cannot be obtained, applicants are asked to not provide names, or other combinations of data, that would identify those supervised. However, they may still provide the type of HQP training and status, years supervised or co-supervised, a general description of the project or thesis, and a general indication of the individual's present position if known.

An example of entering HQP information on Form 100 (with and without consent):

Name	Type of HQP Training and Status	Years Supervised or Co-supervised	Title of Project or Thesis	Present Position
Consent Received from Marie Roy				
Roy, Marie	Undergraduate (Completed)	Supervised 1994 - 1997	Isotope geochemistry in petroleum engineering	V-P (Research), Earth Analytics Inc., Calgary, Alberta
Consent Not Obtained from Marie Roy				
(name withheld)	Undergraduate (Completed)	Supervised 1994 - 1997	Isotope geochemistry	research executive in petroleum industry - western Canada

Consent Form

Name of Trainee	
Applicant Information	
Name Nowrouzezahrai, Derek D	
Department Informatique et recherche opérationnelle	Postsecondary Institution Montréal
I hereby allow the above-named applicant to include limited personal data about me in grant applications submitted for consideration to NSERC for the next six years. This limited data will only include my name, type of HQP training and status, years supervised or co-supervised, title of the project or thesis and, to the best of the applicant's knowledge, my position title and company or organization at the time the application is submitted. I understand that NSERC will protect this data in accordance with the <i>Privacy Act</i> , and that it will only be used in processes that assess the applicant's contributions to the training of highly qualified personnel (HQP), including confidential peer review.	
Trainee's signature	Date
Note: This form must be retained by the applicant and made available to NSERC upon request.	