The PhD in Visualization Starter Kit (PVSK)

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Introduction and Motivation

Writing a PhD is difficult.

- Those just starting a PhD in visualization have not acquired all key skills necessary for completion (not normally taught as part of an undergraduate curriculum).

- How does a researcher navigate through vast amounts (and complexity) of previously published literature?

- Furthermore, for some, this may be their first time implementing a larger, long-term project. Developing a large software application requires more knowledge than implementing a small one.

- Given, a larger sized visualization application, how can bugs and problems be tracked down and eliminated?

- What is a good starting point when it comes time to writing a research paper?

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Introduction and Motivation

We present some essential skills that a PhD candidate in Visualization acquires during their study including

- Reading research papers
  - Identifying and extracting most important information
  - A basis for compiling a literature survey
  - Identify solved and unsolved problems

- Writing research papers
  - Common components a good research paper consist of.
  - What a good introduction, related work, method section contains etc.

- Implementing
  - Important rules of good programming practice, presented concisely
  - background behind those rules and their benefits

- Debugging software
  - Important strategies for tracking down and eliminating bugs in visualization software
  - How to exploit visualization for studying algorithm behavior + correcting problems

We hope that guidelines presented will help jump-start new researcher's journey towards a PhD in visualization.

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Overview

- Introduction and Motivation [10 minutes]

- **Part 1: How to Read a Visualization Research Paper: Extracting the Essentials**
  - based on *IEEE Computer Graphics and Applications (IEEE CG&A)* article, forthcoming
  - 25 minutes

- **Part 2: Bob's Concise Coding Conventions (C3)**
  - based on *Advances in Computer Science and Engineering (ACSE), Vol. 4, No. 1, February 2010, pages 23-36*
  - 45 minutes

- Tea and coffee break

- **Part 3: Using Visualization to Debug Visualization Software**
  - based on *IEEE Computer Graphics and Applications (IEEE CG&A)* article, forthcoming
  - 45 minutes
  - "I enjoyed reading this paper... I will strongly recommend it to all my students." -Jarke J. van Wijk, Eindhoven University of Technology (TUE).

- **Part 4: How To Write A Visualization Research Paper: A Starting Point**
  - based on *Computer Graphics Forum (CGF)* article, forthcoming
  - 35 minutes

- Question, Answers, Discussion

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The PhD in Visualization Starter Kit (PVSK)

**The Visual and Interactive Computing Group,
Computer Science Department, Swansea University**

by
Robert S. Laramee

Announcement: The PhD in Visualization Starter Kit (PVSK) will be presented at the IEEE VisWeek 2010, 24-29 October 2010, Salt Lake City, Utah, USA

Announcement: The PhD in Visualization Starter Kit (PVSK) will be presented at the Information Visualization (IV) 3rd Doctoral Research Workshop, Monday 26th July 2010, London South Bank University, London, UK. All doctoral students (in the area) are welcome! This is an opportunity for you to present your research at any stage of your PhD. You will benefit from feedback on your work and methodology from a combined industry & research panel. Find out more at: http://www.graphicslink.co.uk/IV10/DoctoralWorkshop.htm

Abstract:

Writing a PhD is difficult. And those that are just starting a PhD in visualization have not usually acquired all of the key skills necessary for completion since they are not normally taught as part of an undergraduate curriculum. For example, how does a researcher navigate through the vast amounts of previously published literature related to their topic? Furthermore, for some, this may be their first time implementing a larger, long-term project. Developing a large software application requires more knowledge than implementing a small one. Given, a larger sized visualization application, how can bugs and problems be tracked down and eliminated? And what is a good starting point when it comes time to writing a research paper?

View (100%)

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starting point when it comes time to writing a research paper?

We present some of the essential skills that a PhD candidate in Visualization acquires during their study including (1) reading and (2) writing research papers as well as (3) implementing and (4) debugging software. We hope that the guidelines presented here will help jump-start the new researcher's journey towards a PhD in visualization.

Step 0: If your meetings don't follow a protocol, here is one you can use.

Bob's Minutes of Meeting Protocol (PDF file)

Step 1: Use this manuscript to help navigate through the vast amount of research literature.

How to Read a Visualization Research Paper: Extracting the Essentials, in *IEEE Computer Graphics and Applications (IEEE CG&A), forthcoming* (PDF file, slides)

Step 2: Follow these guidelines while you implement your ideas.

Bob's Concise Coding Conventions (C^3) , in *Advances in Computer Science and Engineering (ACSE)*, Vol. 4, No. 1, February 2010, pages 23-36 (PDF file , slides)

Step 3: These techniques will help you debug your software.

Using Visualization to Debug Visualization Software, in *IEEE Computer Graphics and Applications (IEEE CG&A), forthcoming* (PDF file, slides) *"I enjoyed reading this paper... I will strongly recommend it to all my students."* -Jarke J. van Wijk, Eindhoven University of Technology (TUE).

Step 4: Read this manuscript when it's time to write your first research paper.

How To Write A Visualization Research Paper: A Starting Point in *Computer Graphics Forum (CGF), forthcoming* (PDF file)

The CGF version of the manuscript is based on one that appeared at EG 2009:
How to Write a Visualization Research Paper: The Art and Mechanics, in *EUROGRAPHICS 2009, Education Papers*, pages 59-66, 30 March - 3 April 2009, Munich, Germany (selected as one of the two best education papers) (PDF file, slides)

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Inspiration

Guoning Chen

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Caveat

- PVSK is no substitute for experience or advisor

- Some views expressed contain subjectivity

- PVSK is intended to be useful ***starting point*** (where no starting point previously exists)

- Guidelines and views can easily be altered, customized, adjusted over time and with experience

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For more information please see:

http://cs.swan.ac.uk/~csbob/research/starterKit/

Questions?

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