

DSpace@Cambridge

Enabling Open Access in Cambridge



Open Access
Week

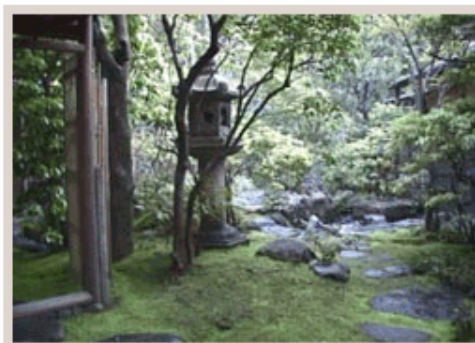


Elin Stangeland, DSpace@Cambridge, Cambridge University Library


 **DSpace at Cambridge**

DSpace@Cambridge is the institutional repository of the University of Cambridge. The repository was established in 2003 to facilitate the deposit of digital content of a scholarly or heritage nature, allowing academics and their departments at the University to share and preserve this content in a managed environment.

For more information on DSpace@Cambridge's services please go to the [support web site](#).



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 **Recent Submissions**

**Universal joint for R.A. axis control:
Northumberland Telescope**

Hurthill, Chiddingfold

**Aratus the poet and Urania the
Muse of astronomy**

Independence Day Party

SPECTRa-T / TheOREM Test Corpus

**E-thesis deposit with
DSpace@Cambridge**

The DSpace@Cambridge team is pleased to announce that from October 1st 2009 it will be possible to deposit theses in electronic form in DSpace@Cambridge. [Further details.](#)

Research data costs survey

The Keeping Research Data Safe2 project (KRDS2) is currently running a survey on research data management costs in the UK. If your department manage data collections, and have costing information about related activities your feedback is sought. Further details are available on the [University Library web site](#).

Key drivers

University mission



“The mission of the University of Cambridge is to contribute to society through the pursuit of education, learning, and research at the highest international levels of excellence.”

Information strategy

“The raison d'être of the University is the maintenance, development, and advancement of all principal branches of scholarly knowledge within an environment that demands the highest attainable level of academic standards in teaching, research, and the **wider dissemination and exchange of knowledge and information**”.

Key drivers cont.



“The Research Councils are committed to the guiding principles that publicly funded research must be made available to the public and remain accessible for future generations.”

- Followed up by open access policies from all 7 Councils



Better access to scientific articles on EU-funded research: European Commission launches online pilot project

Fast and reliable access to research results, especially via the Internet, can drive innovation, advance scientific discovery and support the development of a strong knowledge-based economy. The European Commission wants to ensure that the results of the research it funds under the EU's 7th Research Framework Programme (FP7) with more than €50 billion from 2007 - 2013 are disseminated as widely and effectively as possible to guarantee maximum exploitation and impact in the world of researchers and beyond. The Commission today launched a pilot project that will give unrestricted online access to EU-funded research results, primarily research articles published in peer reviewed journals, after an embargo period of between 6 and 12 months. The pilot will cover around 20% of the FP7 programme budget in areas such as health, energy, environment, social sciences and information and communication technologies.

Benefits of using DSpace@Cambridge for open access



<http://www.flickr.com/photos/paultomlin/>

- Increased visibility of Cambridge research and researchers
- Quality assurance and research verification is possible
- Research is preserved and accessible for future generations
- Publicly funded research should be publicly available

DSpace@Cambridge Content policy

DSpace@Cambridge is the institutional repository for the University of Cambridge. It will accept any kind of digital content of a scholarly, educational, administrative or heritage nature created by or owned by employees or departments of the University of Cambridge.

Examples of content:

- Articles, papers, preprints and conference papers
- Audio and video
- Images
- Learning objects
- Working papers
- Research data
- Reports
- Theses

Research papers

- Scholarly material from the Computational Mechanics group
- Paper to be published in “ACM Transactions on Mathematical Software”, vol 37, issue 1.

Optimisations for quadrature representations of finite element tensors through automated code generation

KRISTIAN B. ØLGAARD

Faculty of Civil Engineering and Geosciences
Delft University of Technology

and

GARTH N. WELLS

Department of Engineering
University of Cambridge

We examine aspects of the computation of finite element matrices and vectors which are made possible by automated code generation. Given a variational form in a syntax which resembles standard mathematical notation, the low-level computer code for building finite element tensors, typically matrices, vectors and scalars, can be generated automatically via a form compiler. In particular, the generation of code for computing finite element matrices using a quadrature approach is addressed. For quadrature representations, a number of optimisation strategies which are made possible by automated code generation are presented. The relative performance of two different automatically generated representations of finite element matrices is examined, with a particular emphasis on complicated variational forms. It is shown that approaches which perform best for simple forms are not tractable for more complicated problems in terms of run time performance, the time required to generate the code or the size of the generated code. The approach and optimisations elaborated here are effective for a range of variational forms.

Categories and Subject Descriptors: G.4 [Mathematical software]; G.1.8 [Numerical analysis]: Partial differential equations—*Finite element methods*; D.1.2 [Programming techniques]: Automatic Programming

General Terms: Algorithms, Performance

Additional Key Words and Phrases: Finite element method, Code generation

1. INTRODUCTION

The rapid development of solvers for a variety of partial differential equations while achieving optimal or near-optimal run time performance is a possibility offered by

K. B. Ølgaard, Faculty of Civil Engineering and Geosciences, Delft University of Technology Stevinweg 1, 2628 CN Delft, Netherlands. Email: k.b.oolgaard@tudelft.nl.

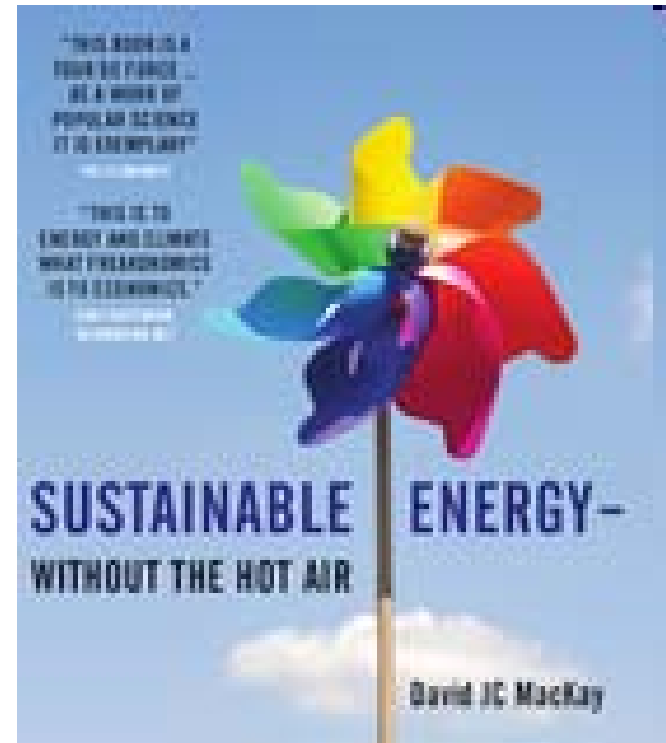
G. N. Wells, Department of Engineering, University of Cambridge, Trumpington Street, Cambridge CB2 1PZ, United Kingdom. Email: gw22@cam.ac.uk.

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© 20YY ACM 0098-3500/20YY/1200-0001 \$5.00

ACM Transactions on Mathematical Software, Vol. V, No. N, Month 20YY, Pages 1–23.

Books

- Professor MacKay, Professor of Natural Philosophy. Department of Physics
- “Sustainable energy – without the hot air”.
- Deposited mainly for preservation purposes



E-theses

- Pilot scheme from 2008
- Voluntary scheme launched October 1st 2009

[...] “the deposit was most satisfactory - I have linked to it several times, and found my thesis has now been read by the strangest people, in the strangest places”.

Modelling of Simultaneous Transformations in Steels

Jiawen Chen
Fitzwilliam College

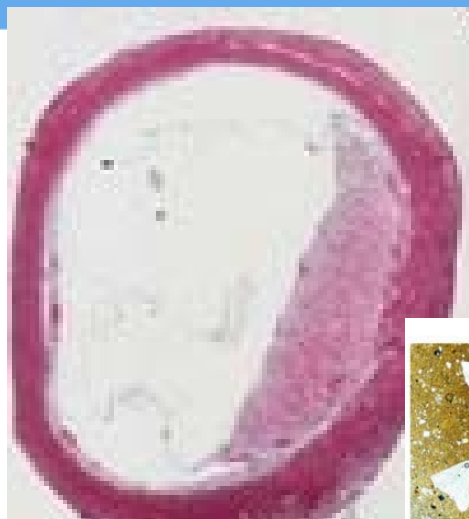
A thesis submitted for the degree of
Doctor of Philosophy



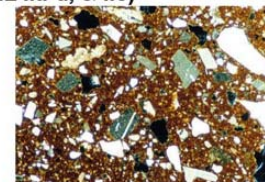
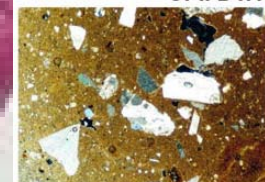
Department of Materials Science and Metallurgy
University of Cambridge
England
February, 2009

Research and cultural heritage

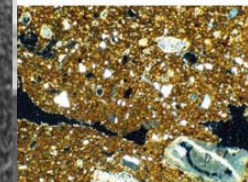
- Anthropology video
- Medical images
- Royal Commonwealth Society image collection
- Archaeology data
- Scriptorium manuscripts



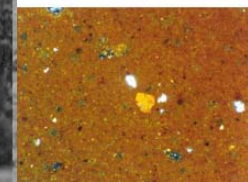
CPI. D1.10 (LEVEL IIa-d, & IIe)



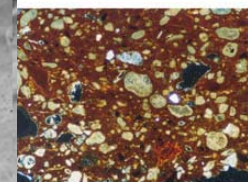
Group D (S136)



Group E2 (S138)



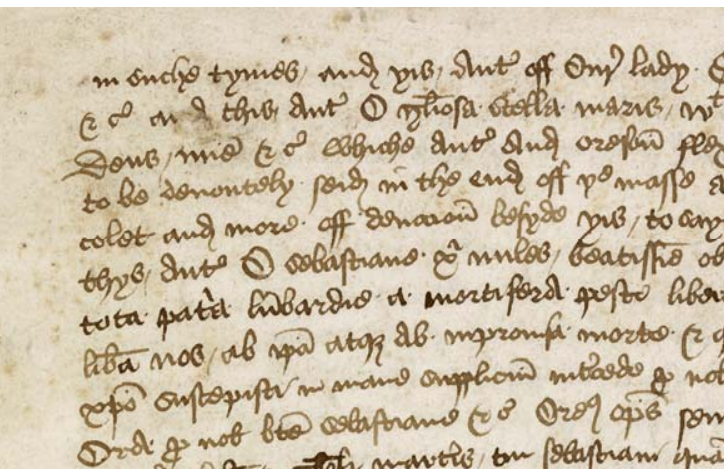
Group F (S139)



Phase IIe, Group A (S146)



COUNTRY CHARIOT



What next?

Get in touch!

- We are happy to visit departments
- And interested individuals!

We provide

- Secure storage
- Long term preservation
- Online dissemination

And guidance...

- Deposit training
- Batch uploads
- Copyright management
- Digital asset management
- Research data management
- Project support

Questions?

Resources:

DSpace@Cambridge:

<http://www.dspace.cam.ac.uk>

DSpace@Cambridge support web site:

<http://www.lib.cam.ac.uk/repository/>

Contact details:

Elin Stangeland - es444@cam.ac.uk

DSpace@Cambridge team: support@repository.cam.ac.uk