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Academic Press Journal Production

Computing and Simplifying 2D and 3D Continuous Skeletons

Dominique Atali[†] and Annicky Montanvert[‡]

[†] *Laboratoire TIMC-IMAG, Equipe INFODIS, Institut Albert Bonniot, Domaine de la Merci, 38706 La Tronche Cedex, France; and* [‡] *L.I.P., E.N.S. de lyon, 46 allée D'ITALIA, 69364 Lyon Cedex 07, France.*

Received March 31, 1995; accepted July 15, 1996

DEDICATED TO THE MEMORY OF NILS BOHR

Skeletons provide a synthetic and thin representation of objects and there are more thoughts represented in this abstract...

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A Level Set Approach to a Unified Model for Etching, Deposition, and Lithography

III. Redoposition, Reemission, Surface Diffusion, and Complex Simulations

D. Adalsteinsson and J. A. Sethian[1]

Department of Mathematics, University of California, Berkeley and Mathematics Department, National Lawrence Berkeley Laboratory

E-mail: dabbi@math.lbl.gov; sethian@math.berkeley.edu

Received December 23, 1996; revised August 5, 1997

Previously, Adalsteinsson and Sethian have applied the level set formulation to the problem of surface...

Here is the body of the article.[2] Here is the body of the article. Here is the body of the article. Here is the body of the article. Here is the body of the article. Here is the body of the article. Here is the body of the article.[3]

[1]Supported in part by the Applied Mathematics Subprogram of the Office of Energy Research under Contract DE-AC03-76SF00098, and the National Science Foundation and DARPA under Grant DMS-8919074.

[2]Here is a normal footnote. Here is a normal footnote. Here is a normal footnote. Here is a normal footnote. Here is a normal footnote. Here is a normal footnote. Here is a normal footnote.

[3]Here is a normal footnote.

Platonic Orthonormal Wavelets[1]

Muran Özaydin and Tomasz Przebinda[2]

Department of Mathematics, University of Oklahoma, Norman, Oklahoma 73019[3]

Communicated by Ph. Tchamitchian

Received June 20, 1995; revised February 10, 1997

We classify all orthonormal wavelets which occur in the L^2 space of the faces of a platonic solid.

Key Words: orthonormal wavelets; platonic solid

CONTENTS

0. INTRODUCTION

This is the introduction. This is the introduction. This is the introduction. This is the introduction. This group acts on the real line $\mathcal{R}$ by the formula

$$(a,b)x = ax + b(a,b) \in G, x \in \mathcal{R}$$

and on the space $L^2(\mathcal{R})$ of square integrable functions on $\mathcal{R}$:

$$\sigma(a,b)v(x) = |a|^{-1/2}v\left((a,b)^{-1}x\right) = |a|^{-1/2}v\left((a^{-1},(x-b)\right),\ v \in L^2(\mathcal{R}). \quad (1)$$

This is the introduction. This is the introduction. This is the introduction.

Some journals require unnumbered text to appear at the bottom of the title page. This is an example of such an unnumbered footnote.

[1]Research partially supported by NSF Grant DMS 9204488.

[2]Correspondence may be sent to Prof. Przebinda, c/o Department of Mathematics.

[3]E-mail: ozaydin@math.uokla.edu; Przebinda@math.uokla.edu.

1. THE AUTOMORPHISM GROUP OF A COMPLETE (q − 1)-ARC AND ITS $\beta\Gamma\Delta\mathcal{B}$ ORBIT

This is a test of a section with math in section head, and a section wrapping.

1.1. Subsection

This is the subsection. This is the subsection. This is the subsection. This is the subsection.

1.1.1. This is Subsubsection

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This is Paragraph. This is paragraph. This is paragraph. This is paragraph. This is paragraph. This is paragraph. This is paragraph. This is paragraph.

2. LISTING ENVIRONMENTS

In 3D, two types of inner tetrahedra can be removed:

- *Hat tetrahedra.* They are characterized by three boundary faces and one inner face. The consequence of their deletion is to shorten a branch of the skeleton. The vertex v associated with a hat tetrahedron is called an *extremity* of a skeleton.
- *Salient tetrahedra.* They are characterized by two boundary faces, two inner faces, and one inner edge.

1. The nomotopy class of the shape is not modified when T is removed.
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By duality, when the simplex T is removed from the current shape, is associated Voronoi vertex v and all the Voronoi elements passing through v are also removed from the skeleton.

(i) invariants can be computed using simple formulae involving ratios of polynomials;

(ii) many configurations are determined up to a collineation by their associated invariants;

(iii) a data base of invariants can be searched efficiently using standard methods from computer science.

...where

N_{BG} = number of boundary groups in the augmented aspect hierarchy
N_{FA} = number of faces in the augmented aspect hierarchy
N_{V} = number of volumes in the augmented aspect hierarchy.

Given $\{\boldsymbol{\omega}^n_{i,j,k}\}$, update $\{\boldsymbol{\omega}^{n+1}_{i,j,k}\}_{k=1}$ by the following steps:

Step 1. Compute $\{\boldsymbol{\Psi}^n_{i,j,k}\}_{k=1}$ by solving

$$-\Delta_h \boldsymbol{\Psi}^n = \boldsymbol{\omega}^n$$

with the boundary condition (2.15).

Step 2. Evaluate the boundary vorticity using (2.16), (2.22)–(2.13).

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NUMBERED THEOREM TYPE ENVIRONMENTS

Here are some example theorem type environments.

Theorem 2.1 (Theorem Title). *This is a theorem*

Theorem 2.2. *This is a theorem*

Proof. This is the proof. ■

Proof (This is a special proof). This is a special proof that includes a title. ■

Corollary 2.1. *This is the corollary. This is the corollary. This is the corollary. This is the corollary. This is the corollary. This is the corollary.*

Proposition 2.1. *Here is a sample proposition. Here is a sample proposition. Here is a sample proposition. Here is a sample proposition. Here is a sample proposition. Here is a sample proposition.*

Lemma 2.1. *This is a lemma. This is a lemma. This is a lemma. This is a lemma. This is a lemma.*

Remark. This is a remark. This is a remark. This is a remark. This is a remark. This is a remark.

Definition 2.1. This is the way a definition looks. This is the way a definition looks. This is the way a definition looks. This is the way a definition looks.

This is text after the definition.

3. SHOWING THEOREMS RENUMBERED WITH NEW SECTION

Theorem 3.1 (Theorem Title). *This is a theorem*

THEOREM 3.2. *This is a theorem*

COROLLARY 3.1. *This is the corollary. This is the corollary. This is the corollary. This is the corollary. This is the corollary. This is the corollary.*

THEOREM TYPE ENVIRONMENT WITH ROMAN TEXT

DEFINITION 3.1. Here is the definition.

UNNUMBERED THEOREM TYPE ENVIRONMENTS

MULTIPLIER CONJECTURE. The First Multiplier Theorem hods whithout the assumption that $p > \lambda$.

SQUARE LEMMA. The First Multiplier Theorem hods whithout the assumption that $p > \lambda$.

Proof of Lemma 2. Here is proof of lemma 2. Here is proof of lemma 2. Here is proof of lemma 2. Here is proof of lemma 2.

Claim. This is a claim. This is a claim. This is a claim. This is a claim. This is a claim. This is a claim. This is a claim.

Remark. This is a remark. This is a remark. This is a remark. This is a remark. This is a remark. This is a remark.

FIGURE SAMPLES

FIG. 1. Here is a short figure caption

FIG. 2. Here is a sample caption which goes on to make a paragraph. Here is a sample caption which goes on to make a paragraph. Here is a sample caption which goes on to make a paragraph.

FIG. 2—*Continued*

FIG. 3a. This is a lettered caption.

Here are two lettered captions.

If we label and cross-reference the lettered caption, we get this: 3a, which is the figure number plus the letter, which is what we want.

FIG. 3b. This is a second lettered caption.

Here is lettered continued caption:

FIG. 3b—*Continued*

The figure below doesn't have caption text.

FIGURE 4

TABLE SAMPLES

TABLE 1

This is a normal table caption. $\alpha\beta\Gamma\Delta\omega$

one	two	three
one	two	three
one	two	three

TABLE 2

This is a normal table caption that will go onto several lines. This is a normal table caption that will go onto several lines. This is a normal table caption that will go onto several lines.

one	two	three
one	two	three
one	two	three

TABLE 3

Numerical Results Obtained for the Solution of Problem III with $\theta = 7^\circ$, $L_x = L_y = 1$, and $N_x = N_y = 1$

	ϵ	$J_{x \ \max}$	$J_{y \ \max}$	$\mathcal{N}_{\max}$	$R^{(2)}$	$\max_{x,y,z} \lvert u - u^J \rvert$
1	1×10^2	6	3	873	2.85	5.09×10^{-3}
2	1×10^3	7	3	1273	3.87	2.73×10^{-3}

TABLE 4

Small Table Caption

This is A Sample[c]	a small[a] with	table[b] asterisks
Here are	the	contents

[a]This is the first note.
[b]This is the second note.
[c]This is the third note.

TABLE 4—*Continued*

$\alpha\beta\Gamma\Delta$ One	Two	Three
one	two	three
one	two	three

BIBLIOGRAPHY CITATIONS

Here is a test of bibliographic citations: [1], [2, 3].

ALGORITHMS

Here are two sample algorithms:

ALGORITHM 1.

Divide the problem into a number of subproblems.

Conquer the subproblems by solving them recursively. If the subproblem sizes are small enough just solve the subproblems in a straightforward manner.

Combine the solutions to the subproblems into the solution for the original problem.

ALGORITHM 2 (CHASE(d, F, I)).

1. **begin**
2. Result := d;
3. Tmp:= $\emptyset$ *****
4. **while** Tmp $\neq$ Result **do**
5. Tmp:=Result; */*usually only 1 interation required*/*
6. Apply the NFD rule or the NIND rule to Result;
7. **end while**
8. **while** $\exists r \in$ Result and $\exists t_1$, $t_2 \in r$ such that $t_1 \sqsubseteq t_2$, $t_1 \neq t_2$ and t_1 was added to r by an application of the NIND rule **do**
9. remove t_1 from r;
10. **end while**
11. **return** Result
12. **end**.

Here we use a reference to the line above, where '**return** Result' is seen on line 11.

APPENDIX

This is the appendix. If no appendix letter is given, we will add an 'A' to the equation number:

$$E \in \infty \tag{A.1}$$

A.1. EXISTENCE AND UNIQUENESS OF SOLUTION OF THE POISSON EQUATION

It is well known that there exists a unique soloution of the Laplace equation with Neumann boundary conditions in the context of orthogonal grids.

A.1.1. Homogeneous Poisson Equation.

The homogeneous problem reads...

APPENDIX: PSPACE ⊇ PCP(LOG N)

This is an appendix with a title. ‘A’ is added to the equation number to indicate that it is in an appendix.

$$E \in \infty \tag{A.1}$$

APPENDIX B

This is a lettered appendix. The letter given will be added to the equation number, and to section numbers.

$$E \in \infty \tag{B.1}$$

B.1. UNIQUE SOLUTION OF THE POISSON EQUATION

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B.1.1. Homogeneous Poisson Equation.

The homogeneous problem reads...

APPENDIX C

This is an appendix title

Here is another appendix.

$$E \in \infty \tag{C.1}$$

ACKNOWLEDGMENT

The authors thank the National Science Foundation for its generous support of our work. Also, the chairman of our department has shown great understanding in allowing us the necessary time to develop the concepts found in this paper.

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1. Anderson, Terry L., and Fred S. McChesney. (n.d.). “Raid or Trade? An Economic Model of Indian-WhiteRelations,” Political Economy Research Center Working Paper 93–1.
2. Lacey, W.K. (1968). *History of Socialism.* Ithaca, NY: Cornell University Press.
3. Oliva, Pavel. (1971). *Sparta and Her Social Problems.* Amsterdam: Adolf M. Hakkert.
4. Zimmern, Alfred. (1961). *The Greek Commonwealth: Politics and Economics in Fifth-Century Athens,* 5th ed. New York: Galaxy Book, Oxford University Press.

MAKING REFERENCES WITH BIBTEX

The following text is an example of what you might enter to make a bibliography with BiBTeX.

Citations include [2], [1], and [3].

REFERENCES

1. Benedetto, J. (1975). *Spectral Synthesis.* Academic Press, New York.
2. Hughes, T. J. R. and Brooks, A. N. (1985). A multi-dimensional upwind scheme with no crosswind diffusion. In Hughes, T. J. R., editor, *Finite Element Methods for Convection Dominated Flows*, pages 19–35. ASME, New York.
3. Heller, W. (1991). *Frames of Exponentials and Applications.* PhD thesis, University of Maryland, College Park, MD.

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The Ukranian Society for Cohomology announces a call for papers for the 22nd annual Cohomologous conference...

Platonic Orthonormal Wavelets[1]

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[1]Research partially supported by NSF Grant DMS 9204488.

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