



9<sup>TH</sup> MICCAI CONFERENCE



**MICCAI 2006 Workshop Proceedings**

**MFCA'06 workshop**

# **Mathematical Foundations of Computational Anatomy**

## **Geometrical and Statistical Methods for Modelling Biological Shape Variability**

October 1<sup>st</sup>, 2006, Copenhagen, Denmark.

<http://www-sop.inria.fr/asclepios/events/MFCA06>

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**Mathematical Foundations of Computational Anatomy**  
**Geometrical and Statistical Methods for Modelling Biological Shape Variability**

Satellite workshop of MICCAI'06 – October 1st – Copenhagen, Denmark

Chairmen: X. Pennec (INRIA), S. Joshi (SCI, Univ. Utah)

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**08:00 – 08:50 Registration**

**08:50 – 09:00 Workshop Opening**

**09:00 – 10:40 Metrics on curves and surfaces**

09:00 – 09:25 **Statistical linear models in Procrustes shape space.**  
M.N. Bossa and S. Olmos

09:25 – 09:50 **An  $H^2$  type Riemannian metric on the space of planar curves.**  
J. Shah.

09:50 – 10:15 **Riemannian Metrics on the Space of Solid Shapes.**  
P.Th. Fletcher and R.T. Whitaker.

10:15 – 10:40 **A New Closed-Form Information Metric for Shape Analysis.**  
A. Peter, and A. Rangarajan.

**10:40 – 11:10 Coffe-break and posters**

**11:10 – 12:00 Point set methods**

11:10 – 11:35 **Entropy-Based Particle Systems for Shape Correspondence.**  
J. Cates, M. Meyer, P.Th. Fletcher and R. Whitaker.

11:35 – 12:00 **Template estimation form unlabeled point set data and surfaces for Computational Anatomy.** J. Glaunès and S. Joshi.

**12:00 – 13:30 Lunch**

## **13:30 – 15:10 Statistics on Diffeomorphisms**

- 13:30 – 13:55 **Left-Invariant Riemannian Elasticity: a distance on shape diffeomorphisms?**  
X. Pennec
- 13:55 – 14:20 **Statistics on Diffeomorphisms in a Log-Euclidean Framework**  
V. Arsigny, O. Commowick, X. Pennec and N. Ayache
- 14:20 – 14:45 **Multivariate Statistics of the Jacobian Matrices in Tensor Based Morphometry and their application to HIV/AIDS**  
N. Lepore, C.A. Brun, M.-C. Chiang, Y.Y. Chou, R.A. Dutton, K.M. Hayashi, O.L. Lopez, H.J. Aizenstein, A.W. Toga, J.T. Becker, and P.M. Thompson
- 14:45 – 15:10 **Singular solutions, momentum maps and computational anatomy**  
C.J. Cotter and D.D. Holm

## **15:10 – 15:30 Coffea break and posters**

## **15:30 – 16:20 New methods for warping, statistics and shape description**

- 15:30 – 15:55 **Intrinsic and Extrinsic Analysis on Computational Anatomy.**  
A. Qiu, L. Younes, M.I. Miller.
- 15:55 – 16:20 **A Continuous 3-D Medial Shape Model With Branching.**  
T.B. Terriberry and G. Gerig.

## **16:20 – 17:30: Posters**

### **Hippocampus-Specific fMRI Group Activation Analysis with Continuous M-Reps**

P.A. Yushkevich, J.A. Detre, K.Z. Tang, A. Hoang, D. Mechanic-Hamilton, M.A. Fernández-Seara, M. Korczykowski, H. Zhang, and J.C. Gee.

### **An Intrinsic Geometric Framework for Simultaneous Non-Rigid Registration and Segmentation of Surfaces?**

N. Lord, J. Ho, B.C. Vemuri, S. Eisenschenk.

### **Geodesic Image Normalization in the Space of Diffeomorphisms.**

B.B. Avants, C.L. Epstein and J.C. Gee.

### **Statistics on Anatomic Objects Reflecting Inter-Object Relations.**

J.-Y. Jeong, S. M.Pizer, and S. Ray.

### **Topological Repair on Voxel-Based Quadrangular Meshes**

P. Lieby, N. Barnes, and B.D. McKay.

### **Non-parametric Image Registration Using Generalized Elastic Nets.**

A. Myronenko, X. Song and M.A. Carreira-Perpin.

### **Measurement of folding in surfaces of arbitrary size in human brain development.**

C. Rodriguez-Carranza, P. Mukherjee, D. Vigneron, J. Barkovich, and C. Studholme.

### **Realizing Unbiased Deformation: A Theoretical Consideration.**

A.D. Leow, M.C. Chiang, S.C. Huang, A.W. Toga, and P.M. Thompson.

### **Geometric Surface and Brain Warping via Geodesic Minimizing Lipschitz Extensions?**

F. Mémoli, G. Sapiro, and P. Thompson.