

ATELIER NSDC « ANALYSE DE DONNÉES DIRECTIONNELLES AVEC APPLICATIONS EN BIOMÉCANIQUE
ET EN IMAGERIE MÉDICALE »

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**NICDS WORKSHOP “THE ANALYSIS OF DIRECTIONAL DATA WITH APPLICATIONS TO
BIOMECHANICS AND BIOMEDICAL IMAGING”**

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When the Data are Functions

JAMES O. RAMSAY

Department of Psychology
McGill University
1205 Dr. Pendfield Avenue
Montréal, QC H3A 1B1
CANADA

ramsay@psych.mcgill.ca

Functional data analysis deals with information distributed over a continuum, such as time, space, wavelength and etc. The function values can be scalars, vectors, matrices, or points in any structured space. As a rule, these functions are assumed to be differentiable. In this talk we look at a number of examples of functional data where the key question is : “What is the natural coordinate system ?” The question is critical if we want to understand the variation that we see from one functional observation to another, as opposed to merely representing them in some handy coordinate scheme. We will see that this question applies to their domain space as well as to their range space. Natural coordinate systems tend to vary themselves from one observation to another, and this connects functional data analysis to differential geometry and can raise some interesting mathematical issues.