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This thesis presents an  
investigation into machine  
learning and data mining  
meth-ods that can be used on  
data from the *Saccharomyces  
cerevisiae* genome. The aim  
is to predict functional  
class for ORFs (Open Reading  
Frames) whose function is  
currently unknown. Analysis

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Functional Data  
of the yeast genome provides many challenges to existing computational techniques.

~~Machine learning and data mining for yeast functional genomics~~

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The high prediction accuracy was probably because machine learning is a data-driven model and there are tight and steady relationships between cellular recognition and functional corona compositions. According to the prediction accuracy shown in Fig. 2 and SI Appendix , Figs. S11 and S12 , the models enabled the prediction of the cell recognition of NPs in both fetal bovine serum (FBS) and human serum (HS).

~~Machine learning predicts the functional composition of ...~~

An improvement in a machine learning (ML) model, called



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'federated learning', is said to enable companies to develop new ways of collecting anonymous data without compromising their privacy ...

~~How a machine learning model collects data without ...~~

Cortex is written in Clojure, and is currently one of the largest and fastest-growing machine learning libraries that uses a functional programming language. The rest of this post will walk through how to build a state-of-the-art classification model in Cortex, and the functional programming paradigms and data augmentation techniques

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~~Functional programming for  
deep learning | by Joyce Xu  
...~~

Machine learning techniques have gained prominence for the analysis of resting-state functional Magnetic Resonance Imaging (rs-fMRI) data. Here, we present an overview of various unsupervised and supervised machine learning applications to rs-fMRI. We offer a methodical taxonomy of machine learning methods in resting-state fMRI.

~~Machine learning in resting-  
state fMRI analysis ...~~  
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where functional analysis is particularly relevant to machine learning is the study of kernel methods, a notable example of which is the kernel Support Vector Machine, where the theory of Reproducing kernel Hilbert space  $s$  (RKHS) from functional analysis plays a big role. Every positive definite kernel  $K$  (on any type of data) uniquely defines a Hilbert space  $H$ , called the RKHS with reproducing kernel  $K$ , which satisfies a set of properties, and in particular ...

~~Is functional analysis relevant to machine~~

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Each specific Machine Learning Methodology approach (manual, Supervised, Unsupervised etc.,) requires differences in levels of internal staff time commitments and infrastructure investments. At the most extreme, manual statistical modelling is an offsite activity that is almost completely non-disruptive.

~~Machine Learning due diligence | Industrial AI and Analytics~~

Automatically Classifying Functional and Non-functional Requirements Using Supervised Machine

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~~Functional Data~~ Abstract: In this paper, we take up the second RE17 data challenge: the identification of requirements types using the "Quality attributes (NFR)" dataset provided. We studied how accurately we can automatically classify requirements as functional (FR) and non-functional (NFR) in the dataset with supervised machine learning.

~~Automatically Classifying  
Functional and Non-  
functional ...~~

Introducing fklearn:  
Nubank's machine learning  
library (Part I) F is for  
Functional. Here at Nubank  
we're big fans of functional

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~~Functional Data~~ programming, and that isn't limited to the Engineering... Learner functions. While in scikit-learn the main abstraction for a model is a class with methods fit and ...

~~Introducing fkllearn:~~  
~~Nubank's machine learning library ...~~

Second, fMRI data are complex to analyze. This is where deep-learning algorithms come into the picture. In a recent study published in the Journal of Medical Imaging, scientists from Texas Tech...

~~Artificial intelligence-~~  
~~based algorithm for the~~

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How such problems can be cured by using the quality, improved access to data saved using smart-contracts and the blockchain.

Challenges to the credibility of Machine Learning pipeline output.

## ~~Restoring Credibility Of Machine Learning Pipeline Output ...~~

functional genomics data which have received little attention in bioinformatics. We applied supervised machine learning to the problem of using phenotype data to predict the functional class of ORFs in *S. cerevisiae*. Three sources of

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~~Functional Data~~  
data were used: TRIPLES, EU-ROFAN and MIPS. The analysis of the data presented a number of challenges to machine

~~Machine learning of  
functional class from  
phenotype data~~

Functional Programming for  
Big Data & Machine Learning  
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~~Gold Mine or Blind Alley?  
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Big ...~~

Cross Validated is a  
question and answer site for



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~~Functional Data~~ people interested in statistics, machine learning, data analysis, data mining, and data visualization. It only takes a minute to sign up. ... Browse other questions tagged machine-learning panel-data functional-data-analysis or ask your own question.

~~machine learning~~ ~~What is functional data?~~ ~~Cross Validated~~

Machine learning is an application of AI that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. As Jim Coleman,

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Functional Data  
Director of global IP at  
Trimble says succinctly,  
"Data is the fuel for AI."

~~Machine learning — it's all  
about the data | Article |  
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fklearn: Functional Machine Learning. fklearn uses functional programming principles to make it easier to solve real problems with Machine Learning. The name is a reference to the widely known scikit-learn library. fklearn Principles. Validation should reflect real-life situations. Production models should match validated models.

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Functional Data  
The book provides an application-oriented overview of functional analysis, with extended and accessible presentations of key concepts such as spline basis functions, data smoothing, curve registration, functional linear models and dynamic systems Functional data analysis is put to work in a wide a range of applications, so that new problems are likely to find close analogues in this book The code in R and Matlab in the book has been designed to permit easy modification to adapt to new data structures and research problems

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Learn functional data structures and algorithms for your applications and bring their benefits to your work now About This Book Moving from object-oriented programming to functional programming? This book will help you get started with functional programming. Easy-to-understand explanations of practical topics will help you get started with functional data structures. Illustrative diagrams to explain the algorithms in detail. Get hands-on practice of Scala to get the most out of functional programming. Who This Book Is For This book is for

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those who have some experience in functional programming languages. The data structures in this book are primarily written in Scala, however implementing the algorithms in other functional languages should be straight forward. What You Will Learn Learn to think in the functional paradigm Understand common data structures and the associated algorithms, as well as the context in which they are commonly used Take a look at the runtime and space complexities with the  $O$  notation See how ADTs are implemented in a functional setting Explore the basic theme of immutability and

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persistent data structures  
Find out how the internal algorithms are redesigned to exploit structural sharing, so that the persistent data structures perform well, avoiding needless copying. Get to know functional features like lazy evaluation and recursion used to implement efficient algorithms Gain Scala best practices and idioms In Detail Functional data structures have the power to improve the codebase of an application and improve efficiency. With the advent of functional programming and with powerful functional languages such as Scala, Clojure and Elixir becoming

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part of important enterprise applications, functional data structures have gained an important place in the developer toolkit.

Immutability is a cornerstone of functional programming. Immutable and persistent data structures are thread safe by definition and hence very appealing for writing robust concurrent programs. How do we express traditional algorithms in functional setting? Won't we end up copying too much? Do we trade performance for versioned data structures? This book attempts to answer these questions by looking at functional

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Implementations of traditional algorithms. It begins with a refresher and consolidation of what functional programming is all about. Next, you'll get to know about Lists, the work horse data type for most functional languages. We show what structural sharing means and how it helps to make immutable data structures efficient and practical. Scala is the primary implementation languages for most of the examples. At times, we also present Clojure snippets to illustrate the underlying fundamental theme. While writing code, we use ADTs (abstract data types).



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Stacks, Queues, Trees and Graphs are all familiar ADTs. You will see how these ADTs are implemented in a functional setting. We look at implementation techniques like amortization and lazy evaluation to ensure efficiency. By the end of the book, you will be able to write efficient functional data structures and algorithms for your applications. Style and approach Step-by-step topics will help you get started with functional programming. Learn by doing with hands-on code snippets that give you practical experience of the subject.

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The book provides an application-oriented overview of functional analysis, with extended and accessible presentations of key concepts such as spline basis functions, data smoothing, curve registration, functional linear models and dynamic systems Functional data analysis is put to work in a wide a range of applications, so that new problems are likely to find close analogues in this book The code in R and Matlab in the book has been designed to permit easy modification to adapt to new data structures and research problems

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Much has changed in technology over the past decade. Data is hot, the cloud is ubiquitous, and many organizations need some form of automation.

Throughout these transformations, Python has become one of the most popular languages in the world. This practical resource shows you how to use Python for everyday Linux systems administration tasks with today's most useful DevOps tools, including Docker, Kubernetes, and Terraform. Learning how to interact and

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Functional Data automate with Linux is essential for millions of professionals. Python makes it much easier. With this book, you'll learn how to develop software and solve problems using containers, as well as how to monitor, instrument, load-test, and operationalize your software. Looking for effective ways to "get stuff done" in Python? This is your guide. Python foundations, including a brief introduction to the language How to automate text, write command-line tools, and automate the filesystem Linux utilities, package management, build systems, monitoring and

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Instrumentation, and automated testing Cloud computing, infrastructure as code, Kubernetes, and serverless Machine learning operations and data engineering from a DevOps perspective Building, deploying, and operationalizing a machine learning project

F# is a multi-paradigm programming language that encompasses object-oriented, imperative, and functional programming language properties. The F# functional programming language enables developers to write simple code to solve complex problems.

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## Starting with the

fundamental concepts of F# and functional programming, this book will walk you through basic problems, helping you to write functional and maintainable code. Using easy-to-understand examples, you will learn how to design data structures and algorithms in F# and apply these concepts in real-life projects. The book will cover built-in data structures and take you through enumerations and sequences. You will gain knowledge about stacks, graph-related algorithms, and implementations of binary trees. Next, you will

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Functional Data understand the custom functional implementation of a queue, review sets and maps, and explore the implementation of a vector. Finally, you will find resources and references that will give you a comprehensive overview of F# ecosystem, helping you to go beyond the fundamentals.

The main objective of this PhD research has been to utilize machine learning techniques on near infrared spectroscopy (NIRS) signals, for the development of highly accurate and clinically practical biomarkers for the objective assessment of pain

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Functional Data Perception. While advances in medical imaging technology have significantly improved the scientific knowledge in regards to the brain's response to noxious stimuli, there remains an unmet clinical need for a practical, inexpensive tool for the reliable and objective assessment of pain perception. Even though functional imaging modalities such as fMRI and PET scans deliver superior spatial information, they are not readily accessible for routine clinical use. On the other hand NIRS is non-invasive, safe, portable and affordable with a short



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setup time. These features make NIRS ideal for clinical applications. In this thesis we used the cold pressor test to induce different levels of pain in healthy subjects while the NIRS signal was recorded from the frontal regions of the brain. We extracted 54 features from each dataset and used machine learning techniques, logistic regression and support vector machine, to classify the signals based on the self-reported pain scores. To select the model for machine learning, we developed our feature selection algorithm based on a RFE-SVM (recursive feature

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Functional Data Elimination - support vector machine) method to find subsets of feature space with the highest classification capability. Through this process we identified a subset of 10 features which could distinguish high-pain from low-pain stimuli with an accuracy of 85% (Leave-one-out cross validation). Moreover we applied functional data analysis on the collected NIRS data and converted discrete samples to continuous curves. This time we used the same RFE-SVM method on the coefficients of fDA bases (as opposed to extracted features) and we achieved

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94% of accuracy to classify low-pain high-pain signals. Then using machine learning techniques (k-means and hierarchical clustering) we found clusters in the data which covered low pain and high pain groups with an accuracy of 91.2%. The center of these clusters can represent the prototype NIRS response of that pain level. Our approaches provided trial-by-trial predictions of pain level from NIRS measurement for each individual (as opposed to methods based on responses averaged across many trials and subjects), and thus, represent a step towards the goal of establishing an

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objective clinical bio marker of pain perception. Further refinement of proposed methods, including incorporating more datasets and employing other noxious stimuli, is required to make the NIRS technique a powerful clinical tool for pain assessment.

The three volume set LNAI 9284, 9285, and 9286 constitutes the refereed proceedings of the European Conference on Machine Learning and Knowledge Discovery in Databases, ECML PKDD 2015, held in Porto, Portugal, in September 2015. The 131 papers presented in these proceedings were

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carefully reviewed and selected from a total of 483 submissions. These include 89 research papers, 11 industrial papers, 14 nectar papers, and 17 demo papers. They were organized in topical sections named: classification, regression and supervised learning; clustering and unsupervised learning; data preprocessing; data streams and online learning; deep learning; distance and metric learning; large scale learning and big data; matrix and tensor analysis; pattern and sequence mining; preference learning and label ranking; probabilistic, statistical,

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Functional Data and graphical approaches; rich data; and social and graphs. Part III is structured in industrial track, nectar track, and demo track.

Introduction to Functional Data Analysis provides a concise textbook introduction to the field. It explains how to analyze functional data, both at exploratory and inferential levels. It also provides a systematic and accessible exposition of the methodology and the required mathematical framework. The book can be used as textbook for a semester-long course on FDA for advanced

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undergraduate or MS statistics majors, as well as for MS and PhD students in other disciplines, including applied mathematics, environmental science, public health, medical research, geophysical sciences and economics. It can also be used for self-study and as a reference for researchers in those fields who wish to acquire solid understanding of FDA methodology and practical guidance for its implementation. Each chapter contains plentiful examples of relevant R code and theoretical and data analytic problems. The material of the book can be

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roughly divided into four parts of approximately equal length: 1) basic concepts and techniques of FDA, 2) functional regression models, 3) sparse and dependent functional data, and 4) introduction to the Hilbert space framework of FDA. The book assumes advanced undergraduate background in calculus, linear algebra, distributional probability theory, foundations of statistical inference, and some familiarity with R programming. Other required statistics background is provided in scalar settings before the related functional concepts are



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Functional Data. Most chapters end with references to more advanced research for those who wish to gain a more in-depth understanding of a specific topic.

Theoretical Foundations of Functional Data Analysis, with an Introduction to Linear Operators provides a uniquely broad compendium of the key mathematical concepts and results that are relevant for the theoretical development of functional data analysis (FDA). The self-contained treatment of selected topics of functional analysis and operator theory includes reproducing kernel Hilbert

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Functional Data Analysis: singular value decomposition of compact operators on Hilbert spaces and perturbation theory for both self-adjoint and non self-adjoint operators. The probabilistic foundation for FDA is described from the perspective of random elements in Hilbert spaces as well as from the viewpoint of continuous time stochastic processes. Nonparametric estimation approaches including kernel and regularized smoothing are also introduced. These tools are then used to investigate the properties of estimators for the mean element, covariance operators, principal

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Functional Data components, regression function and canonical correlations. A general treatment of canonical correlations in Hilbert spaces naturally leads to FDA formulations of factor analysis, regression, MANOVA and discriminant analysis. This book will provide a valuable reference for statisticians and other researchers interested in developing or understanding the mathematical aspects of FDA. It is also suitable for a graduate level special topics course.

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