# Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing)

*By Dirk Husmeier*

**Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing)** By Dirk Husmeier

Conventional applications of neural networks usually predict a single value as a function of given inputs. In forecasting, for example, a standard objective is to predict the future value of some entity of interest on the basis of a time series of past measurements or observations. Typical training schemes aim to minimise the sum of squared deviations between predicted and actual values (the 'targets'), by which, ideally, the network learns the conditional mean of the target given the input. If the underlying conditional distribution is Gaus sian or at least unimodal, this may be a satisfactory approach. However, for a multimodal distribution, the conditional mean does not capture the relevant features of the system, and the prediction performance will, in general, be very poor. This calls for a more powerful and sophisticated model, which can learn the whole conditional probability distribution. Chapter 1 demonstrates that even for a deterministic system and 'be nign' Gaussian observational noise, the conditional distribution of a future observation, conditional on a set of past observations, can become strongly skewed and multimodal. In Chapter 2, a general neural network structure for modelling conditional probability densities is derived, and it is shown that a universal approximator for this extended task requires at least two hidden layers. A training scheme is developed from a maximum likelihood approach in Chapter 3, and the performance of this method is demonstrated on three stochastic time series in chapters 4 and 5.

# Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing)

*By Dirk Husmeier*

**Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing)** By Dirk Husmeier

Conventional applications of neural networks usually predict a single value as a function of given inputs. In forecasting, for example, a standard objective is to predict the future value of some entity of interest on the basis of a time series of past measurements or observations. Typical training schemes aim to minimise the sum of squared deviations between predicted and actual values (the 'targets'), by which, ideally, the network learns the conditional mean of the target given the input. If the underlying conditional distribution is Gaussian or at least unimodal, this may be a satisfactory approach. However, for a multimodal distribution, the conditional mean does not capture the relevant features of the system, and the prediction performance will, in general, be very poor. This calls for a more powerful and sophisticated model, which can learn the whole conditional probability distribution. Chapter 1 demonstrates that even for a deterministic system and 'be nign' Gaussian observational noise, the conditional distribution of a future observation, conditional on a set of past observations, can become strongly skewed and multimodal. In Chapter 2, a general neural network structure for modelling conditional probability densities is derived, and it is shown that a universal approximator for this extended task requires at least two hidden layers. A training scheme is developed from a maximum likelihood approach in Chapter 3, and the performance ofthis method is demonstrated on three stochastic time series in chapters 4 and 5.

**Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) By Dirk Husmeier Bibliography**

**Download and Read Free Online Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) By Dirk Husmeier**

## Editorial Review

## Users Review

**From reader reviews:**

**Alysa Appel:**

Book is to be different for each and every grade. Book for children right up until adult are different content. To be sure that book is very important for us. The book Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) seemed to be making you to know about other knowledge and of course you can take more information. It is very advantages for you. The guide Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) is not only giving you considerably more new information but also to become your friend when you feel bored. You can spend your spend time to read your guide. Try to make relationship together with the book Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing). You never experience lose out for everything if you read some books.

**Timothy Bennington:**

Here thing why that Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) are different and trustworthy to be yours. First of all reading a book is good but it really depends in the content of the usb ports which is the content is as delicious as food or not. Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) giving you information deeper as different ways, you can find any reserve out there but there is no publication that similar with Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing). It gives you thrill reading through journey, its open up your own personal eyes about the thing that will happened in the world which is might be can be happened around you. You can easily bring everywhere like in area, café, or even in your technique home by train. If you are having difficulties in bringing the imprinted book maybe the form of Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) in e-book can be your substitute.

**Molly Marquis:**

Can you one of the book lovers? If yes, do you ever feeling doubt if you are in the book store? Aim to pick one book that you never know the inside because don't assess book by its include may doesn't work this is difficult job because you are scared that the inside maybe not as fantastic as in the outside appearance likes. Maybe you answer might be Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) why because the great cover that make you consider with regards to the content will not disappoint you. The inside or content is fantastic as the outside as well as cover. Your reading sixth sense will directly assist you to pick up this book.

**Dustin Davis:**

This Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) is brand-new way for you who has intense curiosity to look for some information as it relief your hunger of information. Getting deeper you in it getting knowledge more you know or perhaps you who still having tiny amount of digest in reading this Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) can be the light food for you because the information inside this book is easy to get by anyone. These books create itself in the form that is reachable by anyone, sure I mean in the e-book form. People who think that in e-book form make them feel drowsy even dizzy this book is the answer. So you cannot find any in reading a reserve especially this one. You can find what you are looking for. It should be here for you. So , don't miss this! Just read this e-book kind for your better life and knowledge.

# Download and Read Online Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) By Dirk Husmeier #ZFM1SODJA7Y

# Read Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) By Dirk Husmeier for online ebook

Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) By Dirk Husmeier Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) By Dirk Husmeier books to read online.

## Online Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) By Dirk Husmeier ebook PDF download

**Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) By Dirk Husmeier Doc**

**Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) By Dirk Husmeier Mobipocket**

**Neural Networks for Conditional Probability Estimation: Forecasting Beyond Point Predictions (Perspectives in Neural Computing) By Dirk Husmeier EPub**