**LITERATURAL SURVEY**

**TITLE: Remote Sensing and Image Interpretation.**

**Author:** Lillesand, T.M. and Kiefer, R.W. and Chipman, J.W.,

***Remote Sensing and Image Interpretation, 7th Edition*** is designed to be primarily used in two ways: as a textbook in the introductory courses in remote sensing and image interpretation, and as a reference for the burgeoning number of practitioners who use geospatial information and analysis in their work. Because of the wide range of academic and professional settings in which this book might be used, we have made the discussion “discipline neutral.” In short, anyone involved in geospatial data acquisition and analysis should find this book to be a valuable text and reference.

**Title: Deep Learning: methods and applications.**

**Author:** Li Deng and Dong Yu.

This monograph provides an over view of general deep learning methodology and its applications to a variety of signal and information processing tasks. The application areas are chosen with the following three criteria in mind: (1) expertise or knowledge of the authors; (2) the application areas that have already been transformed by the successful use of deep learning technology, such as speech recognition and computer vision; and (3) the application areas that have the potential to be impacted signiﬁcantly by deep learning and that have been experiencing research growth, including natural language and text processing, information retrieval, and multimodal information processing empowered by multi-task deep learning.

**Title: A Logical Calculus of Ideas Immanent in Nervous Activity.**

**Author:** McCulloch, Warren; Walter Pitts.

Because of the “all-or-none” character of nervous activity, neural events and the relations among them can be treated by means of propositional logic. It is found that the behavior of every net can be described in these terms, with the addition of more complicated logical means for nets containing circles; and that for any logical expression satisfying certain conditions, one can find a net behaving in the fashion it describes. It is shown that many particular choices among possible neurophysiological assumptions are equivalent, in the sense that for every net behaving under one assumption, there exists another net which behaves under the other and gives the same results, although perhaps not in the same time. Various applications of the calculus are discussed.

**Title: An introduction to convolutional neural networks.**

A Convolutional neural network (CNN) is a neural network that has one or more convolutional layers and is used mainly for image processing, classification, segmentation and also for other auto correlated data. A convolution is essentially sliding a filter over the input. One helpful way to think about convolutions is this quote from Dr Prasad Samarakoon: “A convolution can be thought as “looking at a function’s surroundings to make better/accurate predictions of its outcome.”Rather than looking at an entire image at once to find certain features it can be more effective to look at smaller portions of the image.

**Title: Receptive fields and functional architecture of monkey striate cortex.**

**Author:** Hubel, D. and Wiesel, T.

The striate cortex was studied in lightly anaesthetized macaque and spider monkeys by recording extracellularly from single units and stimulating the retinas with spots or patterns of light. Most cells can be categorized as simple, complex, or hypercomplex, with response properties very similar to those previously described in the cat. On the average, however, receptive fields are smaller, and there is a greater sensitivity to changes in stimulus orientation. A small proportion of the cells are colour coded.2. Evidence is presented for at least two independent systems of columns extending vertically from surface to white matter. Columns of the first type contain cells with common receptive-field orientations. They are similar to the orientation columns described in the cat, but are probably smaller in cross-sectional area. In the second system cells are aggregated into columns according to eye preference. The ocular dominance columns are larger than the orientation columns, and the two sets of boundaries seem to be independent.3. There is a tendency for cells to be grouped according to symmetry of responses to movement; in some regions the cells respond equally well to the two opposite directions of movement of a line, but other regions contain a mixture of cells favouring one direction and cells favouring the other.4. A horizontal organization corresponding to the cortical layering can also be discerned. The upper layers (II and the upper two-thirds of III) contain complex and hypercomplex cells, but simple cells are virtually absent. The cells are mostly binocularly driven. Simple cells are found deep in layer III, and in IV A and IV B. In layer IV B they form a large proportion of the population, whereas complex cells are rare. In layers IV A and IV B one finds units lacking orientation specificity; it is not clear whether these are cell bodies or axons of geniculate cells. In layer IV most cells are driven by one eye only; this layer consists of a mosaic with cells of some regions responding to one eye only, those of other regions responding to the other eye. Layers V and VI contain mostly complex and hypercomplex cells, binocularly driven.5. The cortex is seen as a system organized vertically and horizontally in entirely different ways. In the vertical system (in which cells lying along a vertical line in the cortex have common features) stimulus dimensions such as retinal position, line orientation, ocular dominance, and perhaps directionality of movement, are mapped in sets of superimposed but independent mosaics. The horizontal system segregates cells in layers by hierarchical orders, the lowest orders (simple cells monocularly driven) located in and near layer IV, the higher orders in the upper and lower layers.