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Baroclinic Channel Model in Fluid Dynamics

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ABSTRACT
A complex flow structure is studied using a 2-dimentional baroclinic channel model Unsteady Navier - stokes equation coupled with equation of thermal energy ,salinity and the equation of state are implemented .System closure is achieved through a modified Prandtl's mixing length formulation of turbulence dissipation The model is applied in a region where the fluid flow is effected by various forcing equation .In this case ,flow is estuarine region affected by diurnal tide and the fresh water inflow in to the estuary and a submerged structure is considered giving possible insight in to stress effects on submerged structure .the result show that in the time evolution of the vertical velocity along downstream edge changes sign from negative to positive .as the dike length increases the primary cell splits and flow becomes turbulent du e to the non-linear effect caused by the dike .these are found to agree favourably with result published in the open literature.
Key Words: Submerged dike, estuarine dynamics, Baroclinic numerical model, Turbulent dike.

I. INTRODUCTION

The two – dimensional baroclinic model predicts flow in a vertical plane with horizontal and vertical momentum equation .from the economic point of view the estuarine dynamics has gained increasing importance .The exploration for oil in this region has brought about an interesting feature of interaction of the water waves and the estuarine structure .the physical model s are not viable due to economic and man –hours point of view and the analytical model s do not gives an exact solution to the problems .Steady of flow characteristics using a numerical model has become an important tool for gaining insight into the dynamical stability.

Accurate predictions of wave transformation due to submerged dike could be achieved by non –linear shallow water waves theories [1] using the boundary integral equation method. A similar approach is applied in Ref. [2] for transformation of periodic wave crossing over the dike. The important and main characterize this interaction is the generation of the vortex in the flow field around the marine objects due to wave body interaction and the subsequent scouring effects .Numerical modeling is confined to mainly the solitary wave transformation on crossing the submerged dike and related corresponding flow fields [3, 4] with some observational studies [5] the present study extends the methodology to the case of a complex resultant forcing of fresh water flow and the semi – diurnal tide existing in estuarine .turbulence changes are accounted as a function of vertical density satisfaction as salinity and thermal energy variation are substantial along the estuary. The model uses a free surface boundary condition to bring in a realistic semi diurnal – tidal forcing on the down- stream Boundary condition are based on the

specification of condition on an incoming characteristic , disposable parameters are used to represent the forcing function which consists of strength of the fresh water and the amplitude of the semi – diurnal tide .Notable feature is the use of upstream scheme for the horizontal advection term in the transport equation s .Numerical investigations delve into flow characteristic in the vertical, the flow evolution and a possible insight into scouring effects at the bottom .

Mining and web structure mining, Clustering, Classification and finding. Association Rule are the techniques used for almost all data mining and web mining task s. other techniques are sequential patterns, regression, Deviation detection and other statistical and machine leaving method .

The Process of identification natural grouping:

This paper focuses on clustering, which is the processing s of objects Most of the existing methods for document clustering are based on the either probabilistic m, methods, and distances based methods such as k-means analysis, hierarchical clustering [10] and nearest neighbor clustering [6] use a selected set of words appearing in a different documents as features The k- algorithmic is a straight forward method s for clustering data [6] .The basic procedure of k-means method typically. begins with the assigning each data items to a cluster .The number of cluster are say, k is provided a priori by the user .Next the cluster center s are calculated by the centroid of the data item in each cluster . After that a new assignment of the data item s to cluster is computed by assigning them to their closest center according to some distance measure. Different distance measure or web matrices are well explained

in [1] .Web matrices are divided into six categories based on its applications.

The second approach user the similarity based on structure of the web page. There are several techniques that can be used to detect lay out structure in HTML documents. Tables are frames are two components that are commonly used to organize the contents of web documents .Thus a tables or frame detection technique is required to give a view of web page layout for an analyzing process. Many developers prefer to use tables rather than frames to design the prefer web pages layout. Even though frames can provide added context and consistency during navigation, they have several serious problems that are related to screen real estate , page model, the speed of the display and the complexity of the web design [8] .Therefore , several researchers have reported their work in table mining due to the efficiency and the popularity of tables for web page layout structure [11, 12] many other approaches such as hybrid, partition based Clustering, based on documents structure [9,10] are also develop by the researcher s using one or other combination of basic clustering techniques mentioned above. The other approaches, which use Neural Networks [7]. and soft computing techniques [6] are also in their way to success .more about the advancement in web mining can be found in [5]

(A)   CLUSTERING METHOD

Web documents clustering using hyperlink structures :The World Wide Web has a rich structure :it contains both textual web documents and the hyper links that connect them The web documents are hyperlink s between them from a directed graph in which the web documents can be views as vertices and the hyperlinks as the directed edges .Algorithms have been developed utilizing this directed graph to extract information contained in a collection of hyperlinked web documents Kleinberg proposed the HITS algorithm based purely on hyperlink information to retrieve the most relevant information :Authority and hub documents may for a user query (Kleinberg   (1998)). However, if the hypertext collection consists of several topics authority and hub documents may also cover the most popular topics and leave out the less popular ones .One way to remedy this situation is to first partition the hypertext collection into topical groups, and present the search results as a list of topics to the user. This leads to the need to cluster web documents based on both the textual and hyperlink information . In this model ,the similarity metric used for clustering web page is based on hyperlink structure , Textual information and co – citation patterns The link information is obtained directly from the link graph .given a link graph G =

(V,E),which is directed , we define the matrix A to be:

$$A_{ij} = \begin{cases} 1 \text{ if } (i,j) \ \varepsilon \ E \text{ or } (j,e) \ \varepsilon \ E \\ \text{if}: \quad 0, \text{ otherwise} \end{cases}$$

A   is the adjacency matrix of the link graph where directionality of the hyperlink is ignored. Link structure alone provides us with rich information on the topics of the documents collection.

(B) The Factor of the Textual Information:

The next factor included is textual information (S) of the web page .The textual information can be included   to better cluster the web documents .moreover , compared to printed literature , web documents reference each other more randomly .thus is another reason that the text information is incorporated in order to regulate the influence of the documents .each web document is represented as a vector in the vector space model of (IR) information retrieval then computes the similarity between them The higher the similarity , the more likely the two documents deal with the same topic .For each element of the vector we use the standard t f .X idf weighting; t f (I , j) X idf (i) . t f (i , j) is the term frequency of the word in documents in documents j, idf   is the inverse Document Frequency corresponding to word i , is defined such as :
idf (i) =   log (no. of total docs) / No. of docs containing word i)
Co–citation (C) is another metric to measure the relevance of two web documents. If there are many documents pointing to both of them , then these two documents are likely to address a similar issue .the Co – citation pattern is used by H .the Co – citation C ij of the documents i and j is the number of the web documents pointing to both i   and j .Incorporating the above information in to the similarity metric , we form the weight
Matrix of the graph;

$$W = \alpha \frac{A \otimes S}{\|A \otimes S\|_2} + (1-\alpha) \frac{C}{\|C\|_2}$$

Where 'α' is weightage ranging from 0 to1.

(C)   Web documents clustering based on their structure

Based on some information the assumption that links that share layout and presentation properties usually point to pages that are structurally similar, are made the set are layout and presentation properties associated with the links of a page can be used to characterize the structure of the page itself. In other words, whenever two or more pages contain links that share the same layout and presentation properties. There are several techniques that can be used to detect layout structure in HTML documents.

Tables and frames are two components that are commonly used to organize the contents of web - documents. Thus, a table or frame detection technique is required to give a view of web page layout for an analyzing process .Many developers prefer to use tables rather than frames to design the web page s, layout. Even though frames can be provides added context and consistency during navigation , they have several serious problems that are related to screen real estate , page model ,the speed of the display and the complexity of web design [4] . Therefore, several researchers have reported their work in table mining due to the efficiency and the popularity of tables for web pages layout structure [15]. A model to abstract structure from a web site, based on the main idea that layout and presentation properties associated with links can characterize the structure of the page can be found at [13].[13] gives a site model generation algorithm for finding the structure and cluster them according to the similarity . The model tries to find the schema of the web site based on the analysis of the HTML code of the web site .Based on the analysis page schemas, page classes, and class links are obtained. The distances between the web pages is calculated .The distances between schemas is defined as the normalized cardinality of the symmetric set difference between the two schemas .namely, G_i and G_j be the schemas of the groups i and j ;
Then such as:

$$\text{Dist}(G_i, G_j) = \frac{|(G_i - G_j) \cup (G_j - G_i)|}{|(G_i \cup G_j)|}$$

II. CONCLUSION

Both of these method were implemented and the initial phase of result is obtained. In initial phase, pages about 150 web pages are clustered. The method based on the hyperlink structure, textual information and Co – citation matrix, is .method 1, gave us a better result s compared to second method .The first method not only cluster s the web page s according to content, but also their related topic. The second method cluster only based on the HTML schema, which is usually found in a organization or pages giving similar type of information. In the second type, web pages related to event like sports, news etc .have the same page structure. In the first method, the calculation for the clusters are complicated compared to the second one. So , when pages from a company or organization or pages for particular events , which usually have the similar structure , are needed to be clustered ,the second method recommended , whereas , if pages along to a particular is needed ,the first method gives us the correct result .

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