

₹ 200

ISSN - 2249-555X

Volume : 1

Issue : 7

April 2012



Journal for All Subjects

www.ijar.in

Listed in International ISSN Directory, Paris.



ISSN - 2249-555X

Indian Journal of Applied Research

Journal for All Subjects

Editor-In-Chief

Dr A Kumar

Director, College Development Council (CDC)
Director, Internal Quality Assurance Cell (IQAC)
Professor in Management,
Department of Business Administration, Faculty of Management,
Bhavnagar University,

Editorial Advisory Board

Dr. S. N. Pathan
Maharashtra

Dr. SM. Ramasamy
Gandhigram

Dr. M. M. Goel
Kurukshetra

Dr. S. Ramesh
Tamil Nadu

Dr Ramesh Kumar Miryala
Nalgonda.

Dr. B. Rajasekaran
Tirunelveli

Dr. A. R. Saravankumar
Tamilnadu

Dr. Roy M. Thomas
Cochin

Dr. G. Selvakumar
Salem

Dr. Apurba Ratan Ghosh
Burdwan

Dr. Shrawan K Sharma
Uttarakhand

Dr. Sudhanshu Joshi
Uttarakhand

Prof. (Dr.) B Anandampilai
Pudhukottai

Advertisement Details

Position	B/W (Single Color)	Fore Color
Full Inside Cover	₹ 6000	₹ 12500
Full Page (Inside)	₹ 5000	-

Subscription Details

Period	Rate	Discount	Amount Payable
One Year (12 Issues)	₹ 2400	Nil	₹ 2400
Two Year (24 issues)	₹ 4800	₹ 200	₹ 4600
Three Year (36 issues)	₹ 7200	₹ 300	₹ 6900
Five Year (60 issues)	₹ 12000	₹ 600	₹ 11400

You can download the Advertisement / Subscription Form from website www.ijar.in. You will require to print the form. Please fill the form completely and send it to the **Editor, INDIAN JOURNAL OF APPLIED RESEARCH** along with the payment in the form of Demand Draft/Cheque at Par drawn in favour of **INDIAN JOURNAL OF APPLIED RESEARCH** payable at Ahmedabad.

1. Thoughts, language vision and example in published research paper are entirely of author of research paper. It is not necessary that both editor and editorial board are satisfied by the research paper. The responsibility of the matter of research paper/article is entirely of author.
2. Editing of the Indian Journal of Applied Research is processed without any remittance. The selection and publication is done after recommendations of at least two subject expert referees.
3. In any condition if any National/International University denies accepting the research paper published in IJAR, then it is not the responsibility of Editor, Publisher and Management.
4. Only the first author is entitled to receive the copies of all co-authors.
5. Before re-use of published research paper in any manner, it is compulsory to take written permission from the Editor-IJAR, unless it will be assumed as disobedience of copyright rules.
5. All the legal undertaking related to Indian Journal of Applied Research is subject to Ahmedabad Jurisdiction.
7. The research journal will be sent by normal post. If the journal is not received by the author of research papers then it will not be the responsibility of the Editor and publisher. The amount for registered post should be borne by author of the research paper in case of second copy of the journal.

Editor,

Indian Journal Of Applied Research

8-A, Banans, Opp. SLU Girls College, New Congress Bhavan, Paldi,
Ahmedabad-380006, Gujarat, INDIA

Contact.: +91-9824097643 E-mail : editor@ijar.in

INDEX

Sr. No.	Title	Author	Subject	Page No.
1	Current Issues In Indian Capital Market	Bhavin S. Shah	Accountancy	1-3
2	Accounting Standard (AS) 30 Accounting for Financial Instruments	Kalola Rimaben A, Chauhan Lalit R.	Accountancy	4-6
3	A Study on Lithology and Petrography of the Tipam Sandstones Exposed along the Tipong Pani River Section of Upper Assam Basin	Dr. Pradip Borgohain	Applied Geology	7-11
4	Study of Fluvial Geomorphic Features of the Lower Subansiri Basin, North-East India using Remote Sensing and GIS.	Dr. Uttam Goswami	Applied Geology	12-14
5	Sheared volcanics in the north of Pugging, East Siang District, Arunachal Pradesh	T. K. Goswami, P. Bhattacharyya, D. Bezbaruah	Applied Geology	15-18
6	Heavy Metal Biosorption Using A Biopolymer Chitin	D. Saravanan, P. N. Sudha	Chemistry	19-23
7	Impact of peripheral cues on rural consumer buying decision for FMCG products with special reference to Palitana (Gujarat)	Dr K.S. Vataliya, Bhavik .P. Parmar	Commerce	24-26
8	A Growth of Rural Postal Life Insurance in India [A Study with special Reference to Dharmapuri District]	Dr. A. Vinayagamoorthy K. Senthilkumar	Commerce	27-28
9	Promotional Strategies for International Markets with respect to Agricultural Products	Dr. B. B. Bhosale	Commerce	29-30
29	Business Risk And Financial Risk - Indian Corporate Sector	Dr. M. Dhanabhakyam, P. Balasubramanian	Commerce	31-33
10	"Customer Relationship Management"- In Banking Industry	G.V. Kori, Sri. Basavaraj Huggi	Commerce	34-36
11	Role of Investment Banks and Institutions in Economic Development	Jitendra Dhirajlal Karia, Dr. (Prof.) Vijay Kumar Soni	Commerce	37-38
12	Nature Of Information Shared And Communication Methods Used In Small Manufacturing Firms	Vipul Chalotra	Commerce	39-41
13	China's WTO Accession: An Empirical Assessment of Merchandise Trade with India	Anjali Tandon	Economics	42-45
14	Regional Disparities - Social Sector Expenditure in Rural-Urban India	Dr. Shankar B. Ambhore, Dr. Ashok S. Pawar	Economics	46-47
15	(Presenting Thought About Industry, Trade And Co-operation Of Rajarshri Shahu Maharaj)	Dr. Ashok Shankarrao Pawar, Dr.Sunita J. Rathod	Economics	48-49
16	An Assessment On Poverty Alliviation Programmes In Rural India-A Case Study	Dr. Parvathamma G. L.	Economics	50-55
17	Liveability in Guwahati: A Factor Analytic Approach	Dr. Daisy Das, Dr. Ratul Mahanta	Economics	56-58
18	Backward Class Disparities in higher Education in India	Dr. Shankar B. Ambhore, Dr. Pawar Ashok S.	Economics	59-60
19	Revenue and Expenditure Pattern of Municipal Corporations of Punjab	Naresh Kumar	Economics	61-66

20	Livelihood Security of Traditional Fishermen of Kerala: Analysing and Identifying the Roles of Self Help Groups	(Dr.) D. Rajasenan, Rajeev B.	Economics	67-70
21	Levels and Types of Questions Raised by EFL Teachers In Southern Al-Mazar Directorate of Education	Dr. Jihad Al-Turki	Education	71-74
22	Issues And Recommendations Of National Knowledge Commission In Higher Education System	Vidhi Bhalla	Education	75-77
23	Multiple Sequence Alignment of Different Species	Perna, Pankaj Bhambri, Dr. O.P. Gupta	Engineering	78-82
24	Analyzing the Phylogenetic Trees with Tree- building Methods	Jasmine, Pankaj Bhambri, Dr. O.P. Gupta	Engineering	83-85
25	Low Power High Speed with Improved Noise Margin for Domino CMOS Inverter.	Pushpa Raikwal, Dr.Vaibhav Neema, Dr.Sumant Katiyal	Engineering	86-88
26	Analysis of Drag for an Aircraft Wing Model with and without Winglet	Mitul Patel, Sharvil Shah, Dharmendra Dubey	Engineering	89-91
27	Cognitive Radio	Chauhan Jayesh R.	Engineering	92-95
28	Problems In Teaching English As A Compulsory Subject	Prof. Madhvi R. Acharya	English	96-97
30	Financial Banking Is The Science Of Managing Money: Indian Financial System	Dr. Shailesh N. Ransariya, Dr. Shailesh N. Ransariya	Finance	98-100
31	Carbon Trading a Step towards Green Environment	Ashok R. Bantwa	Finance	101-102
32	Effect of Supplementation of A Multinutrient Chocolate Bar on Nutritional Status and Athletic Performance	P. Muhtulakshmi, Dr. M. Sylvia Subapriya	Home Science	103-104
33	Imperatives of Inclusive Growth for Sustainable Development of Indian Economy Post Globalization	Dr Mahalaxmi Krishnan	Indian Economy	105-107
34	RIGHT TO INFORMATION ACT AND THE ROLE OF PRESS, MEDIA & NGO'S	Dr. Krushna Chandra Dalai	Law	108-109
35	``Thesis: A Powerful Source Of Information``	Arvind M Bhadrashetty	Library Science	110-111
36	Present Day English and Inflections	Dr Syed Mohammed Haseebuddin Quadri	Literature	112-113
37	Jigsaw II: An Effective Strategy To Develop Reading Comprehension Of High School Students	Dr. P. Nagaraj, Sindhu Thamba	Literature	114-115
38	CAPITAL STRUCTURE ANALYSIS (An Empirical Study of Paper Mills in India)	Ashok Mundhra	Management	116-118
39	Emerging Trends In Indian Rural Market	Dr. N. Ramanjaneyalu	Management	119-121
40	Credit Card Usage in Coimbatore	G. Murali Manokari, Dr. R. Ganapathi	Management	122-126
41	Micro Credit – Two Sides of the Same Coin	R. Durga Rani, J. Gnanadevan, Dr. R. Ganapathi	Management	127-130
42	Work Place Stress and Yoga Therapy	K. Revathi, Dr. R. Ganapathi	Management	131-132
43	Customer's Satisfaction Towards Modernized Petrol Stations With Reference to Coimbatore City	Dr. R. Ganapathi	Management	133-137

44	Evaluation Tactics: A tool to evaluate success of corporate training programme	Dr. Shobha Dedhia	Management	138-140
45	A Preliminary Study On Issues And Challenges Faced In Measurement Of Social Media Return On Investment	Khushbu Pandya	Management	141-142
46	Profitability Analysis (A Case Study of Selected Public and Private Sector Companies)	Manish Manglik	Management	143-144
47	Performance Management System	S.Jayakrishna, N.Sainath, M.V.Subbareddy, N.Raji Reddy	Management	145-147
48	A Study On Organizational Culture In Bharath Heavy Eletrical Limited, Ranipet	S.Sridhar, D.Yuvaraj, V. Kandasamy	Management	148-150
49	Cost Effective Transportation	Sarada Prasanna Patra Dr. Manjusmita Dash	Management	151-154
50	A Study On Efficiency Of Outbound Training With Reference to Titan Industries, Hosur	V. Kandasamy, D. Yuvaraj, S. Ragothaman	Management	155-157
51	Performance Improvement Enhance The Efficiency	Vidya L. Hulkund	Management	158-159
52	Packaging- The Salient Seller	Vidya L. Hulkund	Management	160-161
53	An Empirical Study Of Student Satisfaction With Reference To Gujarat Technological University (Gtu)	Dr. Vijay K. Patel	Management	162-163
54	Maximizing Customer Profitability in Retailing Industry (Durable Goods) - Role of Analytical CRM -A Case Analysis	Dr.A.R.Krishnan, R.Selvamani	Management	164-165
55	Financial Inclusion - Role Of Banking Industry	Dr. K. Marutha Muthu, Ms.T. A.Tamilselvi	Management	166-167
56	The Growth of Self Help Groups in India: A Study	S.Ravi, Dr. P. Vikkraman	Management	168-170
57	Role of E-Banking	K. K. Devi	Marketing	171-172
58	Reasons after the war of going Green –Green Marketing	Kavita A. Trivedi	Marketing	173-175
59	Strongly Minimal Generalized Boundary	K. Chandrasekhara Rao, P . Padma	Mathematics	176-177
60	ACCESSORY RENAL ARTERY: A CASE REPORT	Archana U Shekokar, Vandana A Tendolkardolkar	Medical Science	178-179
61	Fibrinous Pericarditis: A Case Report	Vandana A Tendolkar, Archana U Shekokar	Medical Science	180-181
62	Social life, Addictions and Subjective Wellbeing of the Transsexuals	Seemanthini.T.S, Manjula. M. Y	Psychology	182-184
63	Using E-Content In Science Class: The Effect Of Treatment, Gender, And Their Interaction On Science Achievement	Suman Rani	Psychology	185-188
64	Bullying - Societal Curse- A Serious Issue	Latha Janaki. R, Dr.Kalyani Kenneth	Social Science	189-191
65	Factor Influencing Foetal Wastage	Dr. Dipti Bhavsar, Dr. C. D. Bhavsar	Environment	192-195
66	Approach Of Universilization Educational And Women Empowerment Of Rajarshri Shahu Maharaj	Dr. Ashok Shankarrao Pawar, Dr. Sunita J. Rathod	Economics	196-199



Analyzing the Phylogenetic Trees with Tree- building Methods

* Jasmine **Pankaj Bhambri ***Dr. O.P. Gupta

* Research Scholar, Department of C.S.E, G.N.D.E.C., Ludhiana

** Assistant Prof., Department of IT., G.N.D.E.C., Ludhiana

*** Dy. Director, School of Info. Tech, P.A.U., Ludhiana

Keywords :

1. INTRODUCTION

1.1 Introduction to Bio-informatics

Bioinformatics is a merger of different disciplines including statistics, mathematics, computer science, molecular biology etc. Over the past few decades, major advancements in this field have led to an explosive growth in the biological information. The computerized databases are used to organize, store and index the data. The scope of bio-informatics lies in the development of computational tools and databases.

1.2 Phylogenetic Trees

The Development of a biological form from other pre-existing forms or its origin to the current existing forms through some modifications is known as evolution. The study of evolutionary history of some organisms using tree-like diagrams is known as Phylogenetic tree construction or phylogenetic analysis. These constructions are being used to visualize similarities and divergence among related biological sequences which is done through sequence alignment. The evolutionary divergence is called as phylogeny which is being represented by tree branching patterns. Each time a branch divides into a smaller branch, it shows the emergence of a new group of organisms.

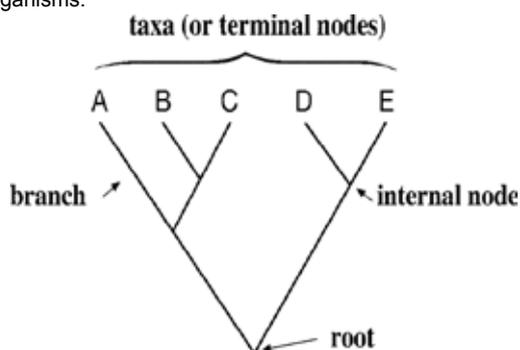


Figure1.1: A typical bifurcating phylogenetic tree showing root, internal nodes, terminal nodes and branches.

2. PROBLEM FORMULATION

The analysis of phylogenetic trees of different species is being formulated by having comparisons among the different tree building methods, thereby obtaining an optimal tree.

2.1 Phylogenetic Analysis

The most popular distance-based methods used for the analysis are:

- The Un-weighted pair group method with arithmetic mean (UPGMA)

- Neighbor joining (NJ)

UPGMA Method: It follows a clustering procedure where initially each species is a cluster on its own. The closest 2 clusters are joined and distance of the joint pair is calculated by taking the average. This process is being repeated until all species are connected in a single cluster. This method is simple and fast. However, it behaves poorly at most cases where the above presumptions are not met.

Neighbor Joining Method (NJ): It begins with an unresolved star-like tree. Each pair is evaluated for being joined and the sum of all branches length is calculated of the resultant tree. The pair that yields the smallest sum is considered the closest neighbors and is thus joined. A new branch is inserted between them and the rest of the tree and the branch length is recalculated. This process is repeated until only one terminal is present. It generally gives better results than UPGMA method. Under some condition, this method will yield a biased tree.

3. MODEL OF COMPUTATION

The distance-based approaches are used for the comparison of trees. The methods used are:

- UPGMA tree-building method
- Neighbor joining method.

3.1 Implementation of UPGMA Method

The simplest clustering method is UPGMA, which builds a tree by a sequential clustering method. UPGMA clusters sequences based on a distance matrix. As the clusters grow, a tree is being assembled.

To measure the distances between the sequences, the following steps are being followed:

- A distance matrix is considered to identify the least dissimilar groups. All nodes are given equal weights. If there are several equidistant minimal pairs, one is picked randomly.
- Combine two nodes to form a new group node.
- This results in the formation of a new, clustered distance matrix having one fewer row and column than the initial matrix.
- Dissimilarities that are not involved in the formation of the new cluster remain unchanged.
- Identify the next smallest dissimilarity and combine those nodes to generate a second clustered dissimilarity matrix. In this process a new distance matrix is formed, and the tree continues to be constructed again and again.
- Continue until there are only two remaining groups, and join those.

The UPGMA method is a commonly used distance method in a variety of applications.

3.2 Implementation of Neighbor Joining Method

It needs the construction of a distance metric.

A distance metric is distinguished by three properties:

- The distance from a point to itself must be zero, that is, $D(x, x) = 0$;
- The distance from point x to y must equal the distance from y to x , that is, $D(x, y) = D(y, x)$;
- The triangle inequality must apply in that $D(x, y) \leq D(x, z) + D(z, y)$.

The similarities are also useful in this case. But the distances (which differ from differences when they obey the above properties) offer appealing properties for describing the relationships between objects.

Given the observed distances between any two sequences i, j can be denoted d_{ij} . The sum of the branch lengths of the tree from node i and j can be denoted d'_{ij} . Ideally, these two distance measures are the same, but phenomena such as the occurrence of multiple substitutions at a single position typically cause d_{ij} and d'_{ij} to differ. The branch lengths can be estimated as:

$$\sum_i \sum_j W_{ij} (d_{ij} - d'_{ij})^2 \quad (3.1)$$

The goal is to minimize this value; it is zero when the branch lengths of a tree match the distance matrix exactly.

However, the NJ method does not assume the nodes to be equidistant from the root. It corrects for unequal evolutionary rates between sequences by using a conversion step. This conversion requires the calculations of "r-values" and "transformed r-values".

The values are described as:

- d'_{AB} = converted distance between A and B
- d_{AB} = actual evolutionary distance between A and B

The formula for conversion is:

$$(3.2) \quad d'_{AB} = d_{AB} - 1/2 \times (r_A + r_B)$$

The value of r_A (or r_B) is the sum of distances of A (or B) to all other nodes. A generalized expression of the r-value, that is, r_i , is calculated based on the following formula:

$$r_i = \sum d_{ij} \quad (3.3)$$

where i and j are two different nodes. The r-values here are needed to create a modified distance matrix for the algorithm to perform. The transformed r-values (r') are used to determine the distances of an individual taxon to the nearest node.

$$r'_i = r_i / n - 2 \quad (3.4)$$

Here n is the total no. of nodes.

4. RESULTS AND DISCUSSION

4.1 Purpose of Analysis

The purpose of phylogenetic analysis is to detect evolutionary changes in species and thereby calculating structural and functional relations among various species.

4.1.1 Methods and Assumptions

Phylogenetic analysis is very subjective in nature. Various assumptions are also needed to obtain the results. One of the most important assumptions is the rate or probability at which one nucleotide substitutes for another. This is called as substitution model. The first main step is to evaluate whether the rates are equal or not. This is done by two methods. Those are:

- Jukes-Cantor Method: No biasing is there. Substitutions occur more randomly. Equal probability of mutation for all nucleotides is there. For deriving evolutionary distances that include hidden changes is calculated by using a logarithmic function.

$$d_{AB} = -(3/4) \ln [1 - (4/3) p_{AB}] \quad (4.1)$$

where d_{AB} is the evolutionary distance between sequences A and B and p_{AB} is the observed sequence distance measured by the proportion of substitutions over the entire length of the alignment.

- Kimura Model: The transitions are more frequent than transversions. It is also called as the Kimura two-parameter model. This is a more sophisticated model than the above model as in this model, mutation rates for transitions and transversion are assumed to be different, which is more realistic. Therefore, it provides a more realistic estimate of evolutionary distances. It uses the following formula:

$$d_{AB} = -(1/2) \ln (1 - 2p_{ti} - p_{tv}) - (1/4) \ln (1 - 2p_{tv}) \quad (4.2)$$

where d_{AB} is the evolutionary distance between sequences A and B, p_{ti} is the observed frequency for transition and p_{tv} is the frequency of transversion.

4.2 Results Regarding Analysis

The methods for determining the phylogenetic trees shows variations among the trees build. These results are being carried out by taking five species of the same family of organisms. As per the data, the phylogenetic tree by UPGMA method is being computed. The results shown are outcome of the distance metrics which are being applied. The second tree which is build by the neighbor joining method is also being computed. The changes in the trees are due to the evolutionary distances between the branches of the trees.

5. CONCLUSION AND FUTURE SCOPE

5.1 Conclusion

The model is constructed for deciding that which method among the distance-based tree building methods yield an optimal tree

UPGMA method had a critical assumption that the rate of nucleotide or amino acid substitution is constant for all the branches in the tree. The branch lengths can be used to estimate the dates of divergence. The assumptions when violated with unequal substitution rates along different branches of the tree, produces an incorrect tree. The un-weighted distances also made an impact that a better tree must be produced for the species given.

The neighbour-joining method gave an optimal tree for the input data and information given because it did not use the un-weighted distances. Also, this algorithm is especially useful when studying large numbers of taxa.

The overall computational results are being shown with respect to the evolutionary distances along both the distance-based methods. Thus, the user can analyze the different computation steps involved for the final assessment.

5.2 Future Scope

Following improvements and further enhancements regarding the developed analysis of phylogenetic trees can be made:

- The model can be extended to analyze and to take a comparison with one tree building method with others.
- Phylogenetic structure prediction can be incorporated to further enhance the model.
- A new tool can be proposed for the phylogenetic tree to give one and only one optimal result without any error.
- Phylogenetic networks can be constructed from the new tool designed.

- Neighbor Joining can be extended to enhance further to give optimal result.

6. SCREEN SHOTS



Figure 6.1: Input of accession no's of five species and specifying the type of distance method to compute distances

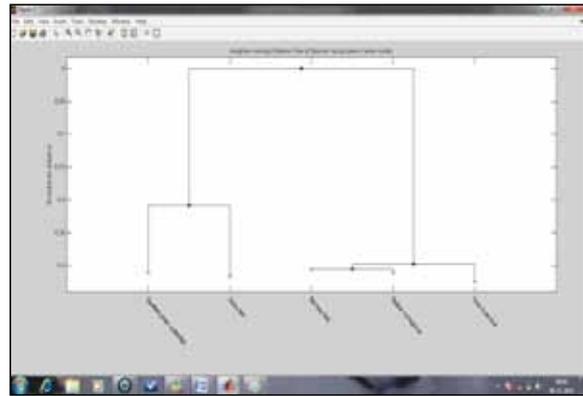


Figure 6.4: Displaying the tree when clicked to Neighbor-Joining method.

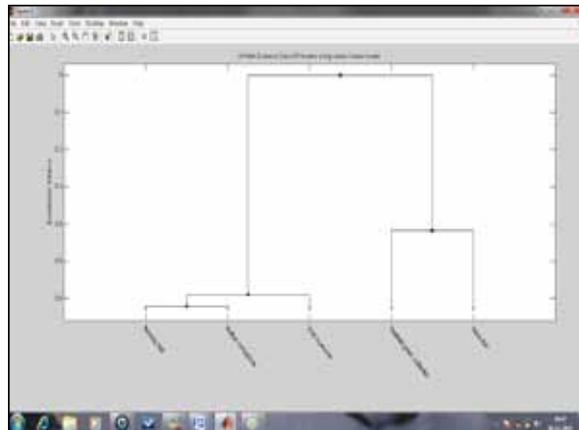


Figure 6.2: Displaying the tree when clicked to UPGMA method.

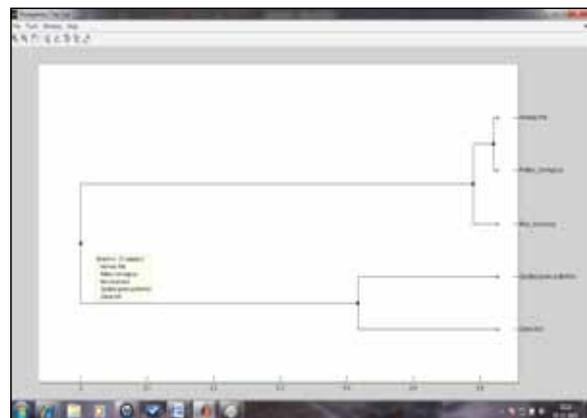


Figure 6.7: Displaying the tree with information



Figure 6.3: Specifying the second method to build a phylogenetic tree.

REFERENCES

[1] Nakhleh, L. (2010), "A Metric on the Space of Reduced Phylogenetic Networks", IEEE/ACM Transactions on computational biology and bioinformatics, vol. 7, no. 2, pp 1-5 | [2] Huson, D., H. (2009), "Drawing Rooted Phylogenetic Networks", IEEE/ACM Transactions on computational biology and bioinformatics, vol. 6, no. 1, pp 1-7. | [3] Cardona, G., Llabre's, M., Rossello', F. and Valiente, G. (2009), "On Nakhleh's Metric for Reduced Phylogenetic Networks", IEEE/ACM Transactions on computational biology and bioinformatics, vol. 6, no. 4, pp 1-10. | [4] Pevsner J., (2009), "Bioinformatics and Functional Genomics", A John Wiley & sons, Inc., Publication, pp 215-221. | [5] Xiong J., (2006), "Essential Bioinformatics", United States Of America, Cambridge University Press, New York., pp 3-8, 31-32, 63, 127-133. | [6] Molad, O., Altman Y. (2001), "Bioinformatics Databases and Tools – Introduction", Algorithms for Molecular Biology, Tel Aviv Univ., pp 1-31. | [7] Rastogi, S., C., Mendiratta, N., Rastogi, P. (2007), "Alignment of Multiple Sequences and Phylogenetic Analysis", Bioinformatics- Methods and Applications, New Delhi, pp 93-120. | [8] Chen, X., Wang, M. and Zhang, H. (2011), "The use for classification trees for bioinformatics", John Wiley & Sons, Inc. WIREs Data Mining Knowl Discov , pp 55-63. | [9] Stoye, J. and Wittler, R. (2009), "A unified approach for reconstructing ancient gene clusters", IEEE Transactions on computational biology and bioinformatics, vol. 6, no. 3, pp 1-14. | [10] Mandoiu, I., Narasimhan, G., Pan, Y. and Zhang, Y. (2010), "Guest Editors' Introduction to the Special Section on Bioinformatics Research and Applications", IEEE Transactions on computational biology and bioinformatics, vol. 7, no. 4, pp 1-14.



Sara Publishing Academy
Indian Journal Of Applied Research
Journal for All Subjects



Editor,
Indian Journal Of Applied Research
8-A, Banans, Opp. SLU Girls College,
New Congres Bhavan, Paldi, Ahmedabad-380006.
Contact.: +91-9824097643 E-mail : editor@ijar.in