INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

IJRCM

IJRCM

A Monthly Double-Blind Peer Reviewed (Refereed/Juried) Open Access International e-Journal - Included in the International Serial Directories

Indexed & Listed at:

Ulrich's Periodicals Directory ©, ProQuest, U.S.A., EBSCO Publishing, U.S.A., Cabell's Directories of Publishing Opportunities, U.S.A., Open J-Gage, India [link of the same is duly available at Inflibnet of University Grants Commission (U.G.C.)], Index Copernicus Publishers Panel, Poland with IC Value of 5.09 & number of libraries all around the world.

Circulated all over the world & Google has verified that scholars of more than 2980 Cities in 165 countries/territories are visiting our journal on regular basis.

Ground Floor, Building No. 1041-C-1, Devi Bhawan Bazar, JAGADHRI – 135 003, Yamunanagar, Haryana, INDIA

http://ijrcm.org.in/

CONTENTS

CALL FOR MANUSCRIPTS

We invite unpublished novel, original, empirical and high quality research work pertaining to recent developments & practices in the areas of Computer Science & Applications; Commerce; Business; Finance; Marketing; Human Resource Management; General Management; Banking; Economics; Tourism Administration & Management; Education; Law; Library & Information Science; Defence & Strategic Studies; Electronic Science; Corporate Governance; Industrial Relations; and emerging paradigms in allied subjects like Accounting; Accounting Information Systems; Accounting Theory & Practice; Auditing; Behavioral Accounting; Behavioral Economics; Corporate Finance; Cost Accounting; Econometrics; Economic Development; Economic History; Financial Institutions & Markets; Financial Services; Fiscal Policy; Government & Non Profit Accounting; Industrial Organization; International Economics & Trade; International Finance; Macro Economics; Micro Economics; Rural Economics; Co-operation; Demography: Development Planning; Development Studies; Applied Economics; Development Economics; Business Economics; Monetary Policy; Public Policy Economics; Real Estate; Regional Economics; Political Science; Continuing Education; Labour Welfare; Philosophy; Psychology; Sociology; Tax Accounting; Advertising & Promotion Management; Management Information Systems (MIS); Business Law; Public Responsibility & Ethics; Communication; Direct Marketing; E-Commerce; Global Business; Health Care Administration; Labour Relations & Human Resource Management; Marketing Research; Marketing Theory & Applications; Non-Profit Organizations; Office Administration/Management; Operations Research/Statistics; Organizational Behavior & Theory; Organizational Development; Production/Operations; International Relations; Human Rights & Duties; Public Administration; Population Studies; Purchasing/Materials Management; Retailing; Sales/Selling; Services; Small Business Entrepreneurship; Strategic Management Policy; Technology/Innovation; Tourism & Hospitality; Transportation Distribution; Algorithms; Artificial Intelligence; Compilers & Translation; Computer Aided Design (CAD); Computer Aided Manufacturing; Computer Graphics; Computer Organization & Architecture; Database Structures & Systems; Discrete Structures; Internet; Management Information Systems; Modeling & Simulation; Neural Systems/Neural Networks; Numerical Analysis/Scientific Computing; Object Oriented Programming; Operating Systems; Programming Languages; Robotics; Symbolic & Formal Logic; Web Design and emerging paradigms in allied subjects.

Anybody can submit the **soft copy** of unpublished novel; original; empirical and high quality **research work/manuscript** ***anytime*** in ***M.S. Word format*** after preparing the same as per our **GUIDELINES FOR SUBMISSION**; at our email address i.e. infoijrcm@gmail.com or online by clicking the link **online submission** as given on our website (***FOR ONLINE SUBMISSION, CLICK HERE***).

GUIDELINES FOR SUBMISSION OF MANUSCRIPT

1. **COVERING LETTER FOR SUBMISSION:**

DATED: _____

THE EDITOR
IJRCM

Subject: **SUBMISSION OF MANUSCRIPT IN THE AREA OF .**

(e.g. Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/Engineering/Mathematics/other, please specify)

DEAR SIR/MADAM

Please find my submission of manuscript entitled '_____' for possible publication in your journals.

I hereby affirm that the contents of this manuscript are original. Furthermore, it has neither been published elsewhere in any language fully or partly, nor is it under review for publication elsewhere.

I affirm that all the author (s) have seen and agreed to the submitted version of the manuscript and their inclusion of name (s) as co-author (s).

Also, if my/our manuscript is accepted, I/We agree to comply with the formalities as given on the website of the journal & you are free to publish our contribution in any of your journals.

NAME OF CORRESPONDING AUTHOR:
Designation:
Affiliation with full address, contact numbers & Pin Code:
Residential address with Pin Code:
Mobile Number (s):
Landline Number (s):
E-mail Address:
Alternate E-mail Address:

NOTES:
a) The whole manuscript is required to be in ***ONE MS WORD FILE*** only (pdf. version is liable to be rejected without any consideration), which will start from the covering letter, inside the manuscript.
b) The sender is required to mentionthe following in the **SUBJECT COLUMN** of the mail:
New Manuscript for Review in the area of (Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/ Engineering/Mathematics/other, please specify)
c) There is no need to give any text in the body of mail, except the cases where the author wishes to give any specific message w.r.t. to the manuscript.
d) The total size of the file containing the manuscript is required to be below **500 KB**.
e) Abstract alone will not be considered for review, and the author is required to submit the complete manuscript in the first instance.
f) The journal gives acknowledgement w.r.t. the receipt of every email and in case of non-receipt of acknowledgment from the journal, w.r.t. the submission of manuscript, within two days of submission, the corresponding author is required to demand for the same by sending separate mail to the journal.

2. **MANUSCRIPT TITLE:** The title of the paper should be in a 12 point Calibri Font. It should be bold typed, centered and fully capitalised.

3. **AUTHOR NAME (S) & AFFILIATIONS:** The author (s) **full name**, **designation**, **affiliation** (s), **address**, **mobile/landline numbers**, and **email/alternate email address** should be in italic & 11-point Calibri Font. It must be centered underneath the title.

4. **ABSTRACT:** Abstract should be in fully italicized text, not exceeding 250 words. The abstract must be informative and explain the background, aims, methods, results & conclusion in a single para. Abbreviations must be mentioned in full.

5. **KEYWORDS:** Abstract must be followed by a list of keywords, subject to the maximum of five. These should be arranged in alphabetic order separated by commas and full stops at the end.

6. **MANUSCRIPT:** Manuscript must be in ***BRITISH ENGLISH*** prepared on a standard A4 size ***PORTRAIT SETTING PAPER***. It must be prepared on a single space and single column with 1" margin set for top, bottom, left and right. It should be typed in 8 point Calibri Font with page numbers at the bottom and centre of every page. It should be free from grammatical, spelling and punctuation errors and must be thoroughly edited.

7. **HEADINGS:** All the headings should be in a 10 point Calibri Font. These must be bold-faced, aligned left and fully capitalised. Leave a blank line before each heading.

8. **SUB-HEADINGS:** All the sub-headings should be in a 8 point Calibri Font. These must be bold-faced, aligned left and fully capitalised.

9. **MAIN TEXT:** The main text should follow the following sequence:

   INTRODUCTION

   REVIEW OF LITERATURE

   NEED/IMPORTANCE OF THE STUDY

   STATEMENT OF THE PROBLEM

   OBJECTIVES

   HYPOTHESES

   RESEARCH METHODOLOGY

   RESULTS & DISCUSSION

   FINDINGS

   RECOMMENDATIONS/SUGGESTIONS

   CONCLUSIONS

   SCOPE FOR FURTHER RESEARCH

   ACKNOWLEDGMENTS

   REFERENCES

   APPENDIX/ANNEXURE

   It should be in a 8 point Calibri Font, single spaced and justified. The manuscript should preferably not exceed ***5000 WORDS***.

10. **FIGURES &TABLES:** These should be simple, crystal clear, centered, separately numbered &self explained, and **titles must be above the table/figure**. **Sources of data should be mentioned below the table/figure**. It should be ensured that the tables/figures are referred to from the main text.

11. **EQUATIONS:**These should be consecutively numbered in parentheses, horizontally centered with equation number placed at the right.

12. **REFERENCES:** The list of all references should be alphabetically arranged. The author (s) should mention only the actually utilised references in the preparation of manuscript and they are supposed to follow **Harvard Style of Referencing**. The author (s) are supposed to follow the references as per the following:

- All works cited in the text (including sources for tables and figures) should be listed alphabetically.
- Use (**ed.**) for one editor, and (**ed.s)** for multiple editors.
- When listing two or more works by one author, use --- (20xx), such as after Kohl (1997), use --- (2001), etc, in chronologically ascending order.
- Indicate (opening and closing) page numbers for articles in journals and for chapters in books.
- The title of books and journals should be in italics. Double quotation marks are used for titles of journal articles, book chapters, dissertations, reports, working papers, unpublished material, etc.
- For titles in a language other than English, provide an English translation in parentheses.
- The location of endnotes within the text should be indicated by superscript numbers.

PLEASE USE THE FOLLOWING FOR STYLE AND PUNCTUATION IN REFERENCES:

BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.
- **ONLINE RESOURCES**
- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITES

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

MULTI-CORE PROGRAMMING PERFORMANCE AND ANALYZES

AJITKUMAR M. PUNDGE
SR. LECTURER
MGM'S DR. G. Y. PATHRIKAR COLLEGE OF COMPUTER SCIENCE & IT
AURANAGABAD

DR. PRAPTI DESHMUKH
PRINCIPAL
MGM'S DR. G. Y. PATHRIKAR COLLEGE OF COMPUTER SCIENCE & IT
AURANAGABAD

SANJAY AZADE
SR. LECTURER
MGM'S DR. G. Y. PATHRIKAR COLLEGE OF COMPUTER SCIENCE & IT
AURANAGABAD

SATISH SANKAYE
ASST. PROFESSOR
MGM'S DR. G. Y. PATHRIKAR COLLEGE OF COMPUTER SCIENCE & IT
AURANAGABAD

ABSTRACT

The research intended to find performance issue on the architecture hardware as well as software prospective boosting up the processors speed is only not the issues but Speedup has been achieved by increasing clock speeds and, more recently, adding multiple processing cores to the same chip. The major Processor manufacturer from Intel , AMD & All leading Processor Manufacturer are boosting CPU Performance from last 20 years to till Date how the change take place not only in processor but also in software development the turning point it seem changing face of hardware too. It suddenly does matter to software, the concurrency revolution will also change the way of writing software in the future. The revolution in software development from structured programming to object oriented Programming is change in the past 30 years. The people are doing Object oriented Programming in simula, JAVA to solve larger Problems for Larger system and writing the program for economical, reliable and repeatable. Using Multi-core architecture and making Multi-core Programming (Parallel Programming) which we can make the difference in sequential as well as parallel programming.

KEYWORDS

Process, thread, Multithread, Multitasking, Multi-core, Multi-core Programming, Parallel Program.

INTRODUCTION

Many applications are written as single threaded program capable of handling only one task at a time, so as not able to take advantage of the technology found in today's multi-core hardware. This application can be requirement for ordered processing, which needs to be rewritten to enable them to handle multi-core hardware.

A thread is discrete sequence of related instruction that is executed independently of the other instruction sequences. Every program has at least one thread the main thread that initializes the program and begins executing the initial instructions. That thread can then create other threads that perform various tasks, or it can create no new threads and simply do all the work itself. In either case, every program has at least one thread.

Each thread maintains its current machine state. On a single processor, multithreading generally occurs by time-division multiplexing (as in multitasking): the processor switches between different threads. This context switching generally happens frequently enough that the user perceives the threads or tasks as running at the same time. To define a thread, only the architecture state required. A logical processor can thus be created by duplicating this architecture space. The execution resources are then shared among the different logical processor can thus created by duplicating this architecture space. The execution resources are then shared among the different logical processors. This technique is known as Simultaneous Multithreading

SMT, Intel's Implementation of SMT is known as Hyper-threading Technology or HT Technology. HT Technology makes a single processor appear, from software's prospective, as multiple logical processors. This allows operating systems and applications to schedule multiple threads to logical processor as they would on multiprocessor systems.

In other words, multiple threads can scheduled, but since the execution resources are shared, its up to the micro-architecture to determine how and when to interleave the execution of the two threads. When one thread stalls another thread is allowed to make progress. These stall events including handing misses and branch mispredictions.

Hyper-threading is about running two or more threads in parallel inside a single CPU. A limiting factor, however, is that although a hyper-threading CPU has some extra hardware including extra register, still it has just one cache Hyper-threading is sometimes cited as offering a 5% to 15% performance boosted. For carefully written multi-threaded application But it doesn't help single threaded application. To overcome all such problem, the hardware industry moved in direction where more than one chip can be embedded on a single die with the same space where previously one core used to be.

The major CPU vendors have shifted gears away from ramping up clock speeds to adding parallelism support on-chip with multi-core processors.

The processor architecture and micro-architecture are undergoing a vigorous shaking-up. The major chip manufacturers have shifted their focus to "multi-core" processors. Optimal application performance on multi-core architecture will be achieved by effectively using threads to partition software workloads. Many applications today use threads as a tool to improve user responsive on single-core platforms. But the performance is boosted only when the application is well-written in multi-threaded.

The terms "Concurrent computing", "Parallel computing", and "distributed computing" have a lot of overlap. And no clear distinction exists between them. The same system may be characterized both as "parallel" and "distributed".

The processors in typical distributed systems run concurrently in parallel. Parallel computing may be seen as a particular tightly-coupled form of distributed computing, and distributed computing may seen as a loosely-couple form of parallel computing. Possibly to roughly classify concurrent systems are "parallel" or

"distributed" using the following criteria. Parallel computing, all processors have access to shared memory. Shared memory can be used to exchange information between processors. In distributed computing, each processor has its own private memory (Distributed memory)

The key issue in programming distributed memory systems is how to distribute the data over the memories. The data can be distributed statically, or it can be moved through the nodes. Data can be moved on demand, or data can be pushed to the new nodes in advance.

Because each processor has its own local memory, it operates independently. Changes it makes to its local memory have no effect on the memory of other processors. Hence, the concept of cache coherency does not apply.

When a processor needs access to data in another processor, it is usually the task of the programmer to explicitly define how and when data is communicated. Synchronization between tasks is likewise the programmer's responsibility.

Advantage is Memory is scalable with number of processors. Increase the number of processors and the size of memory increases proportionately.

Disadvantage is that programmer is responsible for many of the details associated with data communication between processors.

Concurrency is the next major revolution in how we write software. Applications will increasingly need to be concurrent if they want to fully exploit CPU throughput gains that have now started becoming available and will continue to materialize over the next several years.

Intel is talking about someday producing 100-core chips a single-threaded application can exploit at most 1/100 of such a chip's potential throughput.

Multi-core Programming is nothing but the parallel Programming In parallel programming, single tasks are split into a number of subtasks that can be computed relatively independently and then aggregated to form a single coherent solution. Parallel programming techniques can benefit from multiple cores directly.

During our experiment work following are the tools used in our experiment.

- **OpenMP**
- **VTune**
- **Thread Checker**

OpenMP

OpenMP (Open Multi-Processing) is an application programming interface (API) that supports multi-platform shared memory multiprocessing programming in C, C++ and FORTRAN on many architectures, including Unix and Microsoft Windows platforms.

It consists of a set of compiler directives, library routines, and environment variables that influence run-time behavior. OpenMP is an implementation of multithreading, a method of parallelization whereby the master "thread" (a series of instructions executed consecutively) "forks" a specified number of slave "threads" and a task is divided among them.

The threads then run concurrently, with the runtime environment allocating threads to different processors.

VTune

Intel VTune Performance analyzer is a commercial application for software performance analysis for x86 and x64 based machines, and has both GUI and command line interfaces. It is available for both Linux and Microsoft Windows operating systems.

Features of VTune performance analyzer

- **Call graph**
- Provides a graphical view of the flow of an application, and helps to identify critical functions and timing details in the applications.
- **Time-based and Event based sampling**
- Time-based sampling finds program "hot spots" that consume a lot of CPU time.
- **Source view**
- Sampling results are displayed line by line on the source / assembly code.
- **Counter monitor**
- Provides system level performance information, such as resource consumption during the execution of an application
- **Intel Thread Profiler**
- A timeline view shows what threads are doing and how they interact. It shows the distribution of work to threads and locates load imbalances

Thread Checker

Intel® Thread Checker is an analysis tool that pinpoints hard-to-find threading errors like data races and deadlocks in 32-bit and 64-bit applications. Develop multi-threaded applications faster and with less effort and get more performance from multi-core. Intel® Threading Tools make it easier to create multithreaded applications that take advantage of the performance benefits of Hyper-Threading Technology Many applications are written as single threaded program capable of handling only one task at a time, so as not able to take advantage of the technology found in today's multi-core hardware. This application can be requirement for ordered processing, which needs to be rewritten to enable them to handle multi-core hardware.

Rewriting such application needs certain things to consider because.

- The programming model changes: sequential (with optimization) to parallel
- The memory model changes shared (SMP) to non shared (many core)
- The portability & scalability issue arises like insufficient parallel work, synchronization overhead, contention, load balance, task granularity etc.

In our work we have tried to see these issues, how they can be overcome and main work which we tried was to parallelize the program through multithreading and analyzed the result which were on two different mode.

In first mode we run the program in the general environment with sequential mode while in second mode we went through parallelizing the program.

The tools which we have use is openMP, Vtune and thread checker We found performance gains in many applications one of a main program which we considered for experiment is calculation of PI (using Monte Carlo) which showed 75% gain in time over its sequential counterpart. But many of the Programs which we did while working and for understanding the concepts we came up will performance degradation, due to parallelization on computation time.

Our main analysis after working on parallel program is that a proper understanding design, distribution and control over the environment to realize the benefits.

EXPERIMENTAL RESULT FOR SEQUENTIAL OUTPUT

Sr.No	OS	Processor	PI Value	Execution Time in Sec
1	XP	Dual Core	3.141592653590	54.437000 seconds 9.8400000 seconds
2	Vista	Dual Core		6.8440000 seconds
3	XP	Core2Duo		6.582000 seconds 6.734000 seconds 6.844000 seconds 6.843000 seconds

EXPERIMENTAL RESULT FOR PARALLEL OUTPUT

Sr.No	OS	Processor	PI Value	Execution Time in Sec
1	XP	Dual Core	3.141592653590	18.500000 seconds
2	Vista	Dual Core		3.640000 seconds 3.485000 seconds 3.500000 seconds 3.515000 seconds
3	XP	Core2Duo		3.454000 seconds 3.360000 seconds 3.750000 seconds

CONCLUSION

- Application are generally written as single threaded program running one task at a time as not able to take advantage of the technology found in today's multi-core hardware.
- To write program to achieve the capability of running & gaining the power of all the cores. Needs ordered processing and rewriting of the program.
- Rewriting major things to be considered were the scalability issues like insufficient parallel were improper load balancing, synchronization overhead contention, and task granularity.
- While carrying out the experiment we worked in two modes.
    - Sequential
    - parallel
- Major times we have found that there was performance gain one of our program was calculation of PI using Monte carlo method which showed 75% gain in time over its sequential counter part.
- But there were situation where the programs runs in parallel mode showed performance degradation over the sequential one.
- With all this experiments our main aim was to find out the major hotspots in the parallel program which when resolved leads to performance gain.
- In future work we will try to resolve the load balancing, and will try to go more to system specification while creating and synchronization & our major focus will be on implementing ANN on Multi-core system

REFERENCES

1. Bell, C. Gordon, Mudge, J. Craig, McNamara John E. "The PDP-10 Family". (1979). Part V of Computer Engineering: A DEC View of Hardware Systems Design. Digital Equipment Corp.
2. Blaise Barney, "introduction to parallel computing". Lawrence Livermore National Labortory, Livermore Computing. Available at: http://www.llnl.gov/computing/tutorials/parallel_comp/ The OpenMP web site, which includes the C/C++ and Fortran Application Program Interface documents. www.openmp.org
3. David E. Culler, Jaswinder Pal Singh, Anoop Gupta. Parallel Computer Architecture - A Hardware/Software Approach. Morgan Kaufmann Publishers, 1999. ISBN 1558603433,
4. "Designing and Building Parallel Programs". Ian Foster.http://www-unix.mcs.anl.gov/dbpp/
5. Hillis, W. Daniel and Steele, Guy L., Data Parallel Algorithms Communications of the ACM December 1986
6. "Introduction to Parallel Computing". Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar. http://www-users.cs.umn.edu/~karypis/parbook/
7. "Overview of Recent Supercomputers". A.J. van der Steen, Jack Dongarra. www.phys.uu.nl/~steen/web03/overview.html
8. Quinn Michael J, Parallel Programming in C with MPI and OpenMP McGraw-Hill Inc. 2004. ISBN 0-07-058201-7
9. R. Merritt, "CPU Designers Debate Multi-core Future", EETimes Online, February 2008, http://www.eetimes.com/showArticle.jhtml?articleID=206105179
10. Rajkumar Buyya (editor): High Performance Cluster Computing: Architectures and Systems, Volume 1, ISBN 0-13-013784-7, Prentice Hall, NJ, USA, 1999.
11. W. Knight, "Two Heads Are Better Than One", IEEE Review, September 2005

REQUEST FOR FEEDBACK

Dear Readers

At the very outset, International Journal of Research in Computer Application & Management (IJRCM) acknowledges & appreciates your efforts in showing interest in our present issue under your kind perusal.

I would like to request you tosupply your critical comments and suggestions about the material published in this issue as well as on the journal as a whole, on our E-mail**infoijrcm@gmail.com** for further improvements in the interest of research.

If youhave any queries please feel free to contact us on our E-mail infoijrcm@gmail.com.

I am sure that your feedback and deliberations would make future issues better – a result of our joint effort.

Looking forward an appropriate consideration.

With sincere regards

Thanking you profoundly

Academically yours

Sd/-
Co-ordinator

DISCLAIMER

The information and opinions presented in the Journal reflect the views of the authors and not of the Journal or its Editorial Board or the Publishers/Editors. Publication does not constitute endorsement by the journal. Neither the Journal nor its publishers/Editors/Editorial Board nor anyone else involved in creating, producing or delivering the journal or the materials contained therein, assumes any liability or responsibility for the accuracy, completeness, or usefulness of any information provided in the journal, nor shall they be liable for any direct, indirect, incidental, special, consequential or punitive damages arising out of the use of information/material contained in the journal. The journal, nor its publishers/Editors/ Editorial Board, nor any other party involved in the preparation of material contained in the journal represents or warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such material. Readers are encouraged to confirm the information contained herein with other sources. The responsibility of the contents and the opinions expressed in this journal is exclusively of the author (s) concerned.

ABOUT THE JOURNAL

In this age of Commerce, Economics, Computer, I.T. & Management and cut throat competition, a group of intellectuals felt the need to have some platform, where young and budding managers and academicians could express their views and discuss the problems among their peers. This journal was conceived with this noble intention in view. This journal has been introduced to give an opportunity for expressing refined and innovative ideas in this field. It is our humble endeavour to provide a springboard to the upcoming specialists and give a chance to know about the latest in the sphere of research and knowledge. We have taken a small step and we hope that with the active co-operation of like-minded scholars, we shall be able to serve the society with our humble efforts.

Our Other Journals