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August 1995 – January 2025.

## Education

Ph.D. Information Technology (Computer Science Concentration), George Mason University, May 1992.
M.S. Electrical and Computer Engineering, University of Wisconsin, Madison, May 1978.
B.E Electronics and Communication Engineering, Osmania University, India, 1972.

## Teaching Experience: 1994- 2025

Advanced programming, Computer Organization and Architecture, Operating Systems, Database Management Systems I and II, Data Mining, Data Communication Networks, Introduction to Computer Science I and II, Network Management Systems, and System Level Programming.

## Research Experience: 10/1993 – 01/2025

- Summer 96, Summer 97: NASA, Summer Faculty Research Fellowship (ASEE-SFFP research fellowship program).
- 10/1993- 8/1995: Assistant Research Scientist, Institute for Systems Research, University of Maryland, College Park, MD.

**Research Areas:** Founder of Bare Machine Computing (BMC) Paradigm; database management systems, middleware, data integrators, client/server applications, distributed systems, device drivers, source code and binary code transformations, email/webmail applications, network and security protocols, bare machine architectures, bare Internet, BMC architecture, design and development of bare machine computing systems and applications, Universal Processor Architecture, and systems integration.

## Industrial Experience

**Last Position held**: Advisory Programmer/Scientist, IBM Corporation,
December 1978 through October 1993.
(The industrial experience profile listed in reverse chronological order)

During my 15 years of service at IBM, I was the top performer all the time and earned rapid promotions and recognition. I received more than ten thousand dollars for publications, patents, and plateaus. In addition, I received an IBM Resident Study Program to pursue my Ph.D. in computer science with full pay and benefits over a two-year period. I worked in a variety of fields starting from Associate Engineer to Advisory Programmer/Scientist and gained valuable experience. My experience covers a broad spectrum of fields including: semiconductor chip design, design automation, mainframe hardware design, microcode, simulation, large system

architecture, systems design, software development, programming in PLAS, PL/I, C, C++, Java, object-oriented analysis, design, and implementation, and parallel operating systems development.

**5/1993 - 10/1993**: Participated in the development of a reliable fault tolerant software system for the Federal Aviation Administration (FAA) project. Analyzed system requirements for software development, translated customer requirements to Ada programs, tested and debugged ADA code on RS6000/AIX platform. Evaluated software interfaces with respect to object-oriented programming. Involved in planning and developing project schedules for future FAA proposals.

**8/1991 - 5/1993**: Involved in developing a state-of-the art highly parallel supercomputer. This assignment demanded thorough understanding of user interfaces, kernel programs and communication layers in parallel processing environment. Played key role in the development of application programming interface (message passing calls), partition manager for parallel applications, C++ compatibility at API, and software testing. I was also responsible for customer documentation. This system was implemented in 'C' running on RS6000/AIX (UNIX) environment.

**5/1988 - 8/1991**: In the capacity of a Lead Programmer, involved in the development of a rule-based expert system application for airline operations. The IBM's TIRS (The Integrated Reasoning Shell) application programming language, and AIX/C development environment used in this project. Other responsibilities included were knowledge acquisition, software performance modeling, and testing phases of a software engineering project.

**4/1985 - 5/1988**: As a Lead Engineer, developed Common Cryptographic Security Architecture for IBM systems. In addition, I analyzed security issues related to DES algorithms and applications; I was also involved in design of a VLSI chip. Proposed, architected, and designed a CPU processor complex using 1750 based design for the GVSC project using VHSIC technology. I was also responsible for performance modeling and analysis using ADAS tool. I have simulated hardware designs and supervised junior engineers (up to 10). The performance models and analysis conducted during the proposal period won IBM a major GVSC contract.

**12/1978 - 4/1985**: Over 7 years of expertise in IBM mainframes and related areas. I have started as a Junior Engineer and worked the way up to Staff Engineer. During this period, I have mastered mainframe logic designs, learned to solve complex problems, and resolved real-world problems. Earned recognition and respect as a lead design engineer in the department due to technical leadership in areas such as logic design, simulation, performance modeling, 370 architecture, microcode, system integration and testing.

## Journal Publications

1. Fahad Alotaibi 1,*, Ramesh K. Karne 1,*, Alexander L. Wijesinha 1, Nirmala Soundararajan 2 and Abhishek Rangi. An Evaluation of the Security of Bare Machine Computing (BMC) Systems against Cybersecurity Attacks. Cybersecure. Priv. 2024, 4, 678–730. https://doi.org/10.3390/jcp4030033.
2. W. V. Thompson, H. Alabsi, R. K. Karne, S. Liang, A. L. Wijesinha, R. Almajed, A Mass Storage System for Bare PC Applications Using USBs, International Journal on Advances in Internet Technology, Vol 9, No 3, 2016, p63-74.
3. B. Rawal, R. Karne, A. Wijesinha, P. Appiah-Kubi, and S. Liang, Applications of the Split Protocol Paradigm, International Journal of Computers and Their Applications, Volume 21, No. 2, June 2014, p83-94.
4. R. Karne, S. Liang, A. Wijesinha and P. Appiah-Kubi, A Bare PC Mass Storage USB Device Driver, International Journal of Computers and Their Applications (IJCA), March 2013.

**5.** G. H. Khaksari, R. K. Karne and A. L. Wijesinha. A Bare Machine Application Development Methodology, International Journal of Computer Applications (IJCA), Vol. 19, No.1, March 2012, p10-25.

**6.** R. Y R. Yasinovskyy, A. L. Wijesinha, and R. Karne, "VoIP Performance with IPsec in IPv4-IPv6 Transition Networks", Infocommunications Journal, Special Issue on Novel Solutions for Next Generation Services, vol. LXV, no. III, 2010.

**7.** Yasinovskyy, A. L. Wijesinha, and R. Karne, "VoIP Call Performance over IPv6 during HTTP and BitTorrent Downloads", 22nd International Conference on Parallel & Distributed Computing and Communications Systems (PDCCS), 2009.

**8.** Karne, R.K., Wijesinha, A.L., and Ford, G. Opinion—Stay on course with an evolution or choose a revolution in computing, Computer Architecture News, Volume 36, Number 4, Sept. 2008, p1-6.

**9.** He, L., Karne, R.K., and Wijesinha, A. L. Design and Performance of a bare PC Web Server, International Journal of Computer Applications, June 2008.

**10.** Karne, R. K., et.al., Integrated Product and Process Design Environment Tool for Manufacturing T/R Modules, Intelligent Manufacturing, Chapmann & Hall Press, Volume 9, Number 1, February 1998, p9-15.

**11.** Karne, R. K., Object-oriented Computer Architectures for New Generation of Applications, Computer Architecture News, December 1995.

**12.** Karne, R. K., and Arun K. Sood., Feasibility Study: Massively Parallel Architecture for Time-based Simulation Applications, Transactions of The Society for Computer Simulation, December 1994.

**13.** Frieder, O., Topkar, V. A., Karne, R. K., and Sood, A. K., Experimentation with Hypercube Database Engines, IEEE Micro, February 1992.

**14.** Karne, R. K., and Arun K. Sood., PARS: A Parallel Architecture for Rule-based Simulation, Transactions of The Society for Computer Simulation, Volume 9, Number 2, June 1992, p59-p85.

**15.** Karne, R. K., and Tabak, D., A Parallel Inference Engine Simulation, Engineering Applications of Artificial Intelligence, Vol 2, June 1989, p162-p172.

## Conference Publications

1. R. K. Karne, A. L. Wijesinha, and N. Soundararajan, Survey of Bare Machine Computing Systems and Applications, 2025 the 11th International Conference on Computer and Communications, Chengdu, China, Dec 12-15, 2025.
2. Fahad, Alotaibi; Karne, R.K.; Wijesinha, A.; Soundararajan, N.; Rangi, A. A Chat Application on a Bare Internet. In Proceedings of the 18th IEEE International Workshop on Security, Trust, and Privacy for Software Applications (STPSA), COMPSAC 2024, Osaka, Japan, 2-4 July 2024; pp. xxx–xxx.
3. Fahad Alotaibi, Ramesh K. Karne, Alexander L.Wijesinha, A Stateless Bare PC Webserver, Conference WEBIST 2023, November 2023, Rome, Italy.
4. D. N. Naraharisetti , R. K. Karne , J. Weymouth , and A. L. Wijesinha, Introducing a High School Student to Systems Programming Via Bare Machine Computing, 12th Computing Conference, July 11-12, 2024, London, U.K.
5. Navid Ordouie, Ramesh K. Karne, Alexander L. Wijesinha, and Nirmala Soundararajan, A Simple UDP-Based Web Server on a Bare PC with 64-bit Multicore Processors: Design and Implementation, International Conference on Computing, Networking, and Communications, ICNC 2023, Feb 2023.

6. Dheeraj Naraharisetti, Ramesh K. Karne, Alexander L. Wijesinha, and Joel Weymouth, Obsolescence in Operating Systems and Microprocessors, SERA 2023.
7. Joel Weimouth, Ramesh K. Karne, Survey of Innovation in Computer Science Education with Undergraduate Emphasis, International Conference on Computational Science and Computational Intelligence, CSCI, 2021.
8. N. Ordouie, N. Soundararajan, R. K. Karne, and A. L. Wijesinha, Developing Computer Applications without any OS or Kernel in a Multi-core Architecture, International Symposium on Networks, Computers and Communications (ISNCC) 2021.
9. N. Soundararajan, R. Karne, A. Wijesinha, N. Ordouie, H. Chang, Design Issues in Running a Webserver on Bare PC Multi-Core Architecture, IEEE 44th Annual Computers, Software,and Applications Conference (COMPSAC), 2020.
10. N. Soundararajan, J. Weymouth, R. K. Karne, A. L. Wijesinha, and N. Ordouie, Remote Collaboration Potential in STEM Education using Bare Machine Computing Research, International Conference on Computational Science and Computational Intelligence (CSCI), 2020.
11. N. Soundararajan, R. K. Karne, A. L. Wijesinha, N. Ordouie, and B. S. Rawal, A Novel Client/Server Protocol for Web-based Communication over UDP on a Bare Machine, 18th IEEE Student Conference on Research and Development (SCOReD), 2020.
12. H.Alabsi, R. K. Karne, A. Wijesinha, R. Almajed, B. Rawal, and F. Almansour, A Novel SQLite-Based Bare PC Email Server, 15nth International Conference, BDAS2019, Ustron, Poland, May 28-31, 2019, p341-p353.
13. R.Almajed, R. K. Karne and A.L. Wijesinha, Binary Transformation of Applications to run on Bare PCs, The 34th ACM/SIGAPP Symposium On Applied Computing, April 8-12, 2019, Limassol, Cyprus.
14. S.Almutairi, R. K. Karne and A.L. Wijesinha, A Bare PC Text Based Browser, 2019 Workshop On Computing, Networking and Communications (CNC), Honolulu, Hawaii, February 2019.
15. S.Almutairi, R. Karne, A. Wijesinha, H. Chang, R. Almajed, H. Alabsi, W. Thompson, and N. Soundararajan An API for Bare Machine Computing Applications, IEEE SoutheastCon, April 2019.
16. Soundararajan,, R. Karne, A. Wijesinha, N. Ordouie, and H. Chang, Design Issues in Running a Web Server on Bare PC Multi-Core Architecture, IEEE 44th Annual Computers, Software, and Applications Conference (COMPSAC), 2020.
17. F. Almansour, R. Karne, A. Wijesinha, R. Almajed, and H. Alabsi, An Upward Compatible Ethernet Device Driver for Bare PC Applications, 11th International Conference on Information and Communication Systems (ICICS), 2020.
18. N. Ordouie, R. Almajed, R. Karne, A. Wijesinha, J. Weymouth, and N. Soundararajan, Transformation Methodology of Binary Executables to Run on Bare Machines, 35th International Conference on Computers and Their Applications (CATA). 2020.
19. F. Almansour, R. Karne, A. Wijesinha, and B. Rawal, Ethernet Bonding on a Bare PC Web Server with Dual NICs, 33rd ACM Symposium on Applied Computing (SAC), pp. 1116-1122, 2018.
20. R. A. Almajed, W. Agosto-Padilla, R. K. Karne, and A. L. Wijesinha, Integrating an 802.11 Wireless Application in a Linux Kernel Module with a Bare PC Application, 33rd International Conference on Computers and their Applications (CATA), pp. 110-116, 2018.

21. H. Z. Alabsi, W. V. Thompson, R. K. Karne, A. L. Wijesinha, R. A. Almajed, and F. A. Almansour, A Bare Machine RAID File System for USBs, 26th International Conference on Software Engineering and Data Engineering (SEDE), pp. 113-119, 2017.
22. F. Almansour, R. K. Karne, A.L. Wijesinha, H. Alabsi and R. Almajed, Middleware for NICs in Bare PC Applications, 26th International Conference on Computer Communications and Networks (Poster Paper), ICCCN2017, Vancouver, Canada, 2017.
23. W. Thompson, R. K. Karne and A.L. Wijesinha, Interoperable SQLite for a Bare PC, 13th International Conference Beyond Database Architectures and Structures (BDAS'17), 2017, p177-188.
24. Thompson, W., Karne, R. K., Liang, S., Wijesinha, A.L, Alabsi, H, and Chang, H., "Implementing a USB File System for Bare PC Applications**",** The Eleventh International Conference on Internet and Web Applications and Services, May 22-26, Valencia, Spain, IARIA, 2016, p-58-63.
25. Chang, H., Karne, R.K. and Wijesinha, A.L., Migrating a Bare-PC Webserver to Multi-core Architecture, COMPSAC 2016. Atlanta, GA, p216-221.
26. Rawal, B, Karne, R.K, and Duan, Q., "Split-system: The New Frontier of Cloud Computing,"
    2015 IEEE 2nd International Conference on Cyber Security and Cloud Computing, p374-381.
27. W. Agosto-Padilla, R. Karne, A. Wijesinha, Insights into Transforming a Linux Wireless Device Driver to Run on a Bare Machine, 10th International Conference on Evaluation of Novel Software Approaches to Software Engineering (ENASE 2015).
28. H. Chang, R. Karne and A. Wijesinha, Insight Into the x86-64 Bare PC Application Boot/Load/Run Methodology, The Twenty Second International Conference on Software Engineering and Data Engineering, SEDE 2013, Los Angeles, CA September 25-27.
29. U. Okafor, R. Karne, A. Wijesinha, and P. Appiah-Kubi, A Methodology to Transform an OS-based Application to a Bare Machine Application, The 12th IEEE International Conference on Ubiquitous Computing and Communications (IUCC-2013), July 16 - 18, Melbourne, Australia, 2013.
30. A. Tsetse, A. Wijesinha, R. Karne, A. Loukili and P. Appiah-Kubi, An Experimental Evaluation of IPV4-IPV6 IVI Translation, Applied Computing Review, March 2013, Vol. 13, No. 1, pages 19-27.
31. R. Yasinovskyy, A. Alexander, A. Wijesinha and R. Karne, Bare PC SIP User Agent Implementation and Performance for Secure VoIP, International Journal on Advances in Telecommunications, Vol. 5, No. 3 & 4, 2012, pages 111-119.
32. U. Okafor, R. K. Karne, A. L. Wijesinha and B. Rawal, Transforming SQLITE to Run on a Bare PC, 7th International Conference on Software Paradigm Trends (ICSOFT), pages 311-314, Rome, Italy, July 2012.
33. A. K. Tsetse, A. L. Wijesinha, R. K. Karne and A. Loukili, A Bare PC NAT Box, International Conference on Communications and Information Technology (ICCIT 2012), June 26-28 2012, Hammamet, Tunisia.
34. A. K. Tsetse, A. L. Wijesinha, R. K. Karne and A. Loukili. Measuring the IPv4-IPV6 IVI Translation Overhead, ACM Research in Applied Computation Symposium (RACS 2012), Oct 23-26 2012, San Antonio Texas, USA (Best Paper Award).
35. B. S. Rawal, R. K. Karne, A. L. Wijesinha, H. Ramcharan and S. Liang, A Split Protocol Technique for Web Server Migration, The 2012 International Workshop on Core Network

Architecture and Protocols for Internet (ICNA 2012), October 8-11, 2012, Las Vegas, Nevada, USA.

36. A. Peter, R. K. Karne, and A. L. Wijesinha, A Bare Machine Sensor Application for an ARM Processor, *2013 IEEE Electro/Information Technology Conference (EIT)*, Rapid City, SD, USA, May 9-11, 2013.
37. A. Peter, R. K. Karne, A. L. Wijesinha, and P. Appiah-Kubi, Transforming a Bare PC Application to Run on an ARM Device, *2013 IEEE Southeastcon Conference*, Jacksonville, FL, USA, April 4-7, 2013.
38. A. Peter, R. K. Karne, A. L. Wijesinha, and P. Appiah-Kubi, The Design and Implementation of Bare PC Graphics, *4th* International Conference on Evolving Internet (Internet 2012), Venice, Italy, June 24-29, 2012 (Best Paper Award).
39. U. Okafor, R. Karne, A. Wijesinha, and P. Appiah-Kubi, Eliminating the Operating System via the Bare Machine Computing Paradigm, **5th International Conference on Future Computational Technologies and Applications (**Future Computing), 2013.
40. *A. Loukili, A. Tsetse, A. Wijesinha, R. Karne, and P. Appiah-Kubi,* Performance of an IPv6 Web Server under Congestion, 12th International Conference on Networks (ICN), 2013.
41. A. Loukili, A. L. Wijesinha, R. K. Karne, and A. K. Tsetse, TCP's Retransmission Timer and the Minimum RTO, 21st International Conference on Computer Communications and Networks (ICCCN), 2012.
42. B. Rawal, R. K. Karne, and A. L. Wijesinha. Mini Web Server Clusters for HTTP Request Splitting, 2011 IEEE International Conference on High Performance Computing and Communications, Banff, Canada, p94-100.
43. A. K. Tsetse, A. L. Wijesinha, R. K. Karne, and A. Loukili, "A 6to4 Gateway with Co-located NAT", IEEE International Conference on Electro/Information Technology (EIT), 2012.
44. A. Loukili, A. L. Wijesinha, R. K. Karne, and A. K. Tsetse, "Web Server Performance with Cubic and Compound TCP", 7th International Conference on Communication, Internet, and Information Technology (CIIT), 2012.
45. A. Alexander, R. Yasinovskyy, A. Wijesinha, and R. Karne, "SIP Server Implementation and Performance on a Bare PC", International Journal in Advances on Telecommunications, vol. 4, no. 1 & 2, 2011.
46. B. Rawal, R. K. Karne, and A. L. Wijesinha. Splitting HTTP Requests on Two Servers, the Third International Conference on Communication Systems and Networks: COMSNETS 2011, January 2011, Bangalore, India.
47. N. Kazemi, A.L. Wijesinha, and R. Karne. Evaluation of IPsec Overhead for VoIP using a Bare PC, 2nd International Conference on Computer Engineering and Technology (TCCET), 2010.
48. Alexander, A. L. Wijesinha, and R. Karne. A Study of Bare PC SIP Server Performance, the Fifth International Conference on Systems and Networks Communications. ICSNC 2010, August 22-27, Nice, France.
49. Alexander, A. L. Wijesinha, and R. Karne. Implementing a VOIP Server and a User Agent on a Bare PC, the Second International Conference on Future Computational Technologies and Applications, Future Computing 2010, November 21-26, Portugal, Lisbon.
50. Patrick, A. L. Wijesinha, and R. Karne. The Design and Performance of a Bare PC Webmail Server, The 12th IEEE International Conference on High Performance

Computing and Communications, AHPCC 2010, Sept 1-3, 2010, Melbourne, Australia, p521-526.

51. N. Kazemi, A. L. Wijesinha, and R. Karne, "Design and Implementation of IPsec on a Bare PC", 2nd International Conference on Computer Science and its Applications (CSA), 2009.
52. Ford, G.H., Karne, R.K., Wijesinha, A.L., and Appiah-Kubi, P. The Design and Implementation of a Bare PC Email Server, 33rd Annual IEEE International Computer Software and Applications Conference (COMPSAC 2009), Seattle, Washington, July 2009, p480-485.
53. G. H. Ford, R. K. Karne, A. L. Wijesinha, and P. Appiah-Kubi, "The Performance of a Bare Machine Email Server," 21st International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD 2009), IEEE / ACM Publications, 28-31 October 2009, São Paulo, SP, Brazil, pp. 143 – 150.
54. A. Emdadi, R. K. Karne, and A. L. Wijesinha, "Implementing the TLS Protocol on a Bare PC", ICCRD2010, The 2nd International Conference on Computer Research and Development, Kaula Lumpur, Malaysia, May 2010.
55. He, L., Karne, R.K., Wijesinha, A.L., and Emdadi, A. A Study of Bare PC Web Server Performance for Workloads with Dynamic and Static Content, the 11th IEEE International Conference on High Performance Computing and Communications (HPCC-09), Seoul, Korea, June 2009, p494-499.
56. A. Alexander, A. L. Wijesinha, and R. Karne, "An Evaluation of Secure Real-Time Protocol (SRTP) Performance for VoIP", 3rd International Conference on Network and System Security (NSS), 2009.
57. R. Yasinovskyy, A. L. Wijesinha, and R. Karne, "VoIP Call Performance over IPv6 during HTTP and BitTorrent Downloads", 22nd International Conference on Parallel & Distributed Computing and Communications Systems (PDCCS), 2009.
58. R. Yasinovskyy, A. L. Wijesinha, and R. Karne, "Impact of IPsec and 6to4 on VoIP Quality over IPv6", 10th International Conference on Telecommunications (ConTEL), 2009.
59. G. H. Khaksari, A. L. Wijesinha, and R. Karne, "Secure VoIP using a Bare PC", 3rd International Conference on New Technologies, Mobility and Security (NTMS), 2009.
60. Yasinvoskyy, R. Wijesinha, A. L, Karne, R.K, and Khaksari, G. A Comparison of VoIP Performance on IPv6 and IPv4 Netoworks, The 7th ACS/IEEE International Conference on Computer Systems and Applications, Rabat, Morocco, May 10-13, 2009.
61. Khaksari, G. H., Wijesinha, A. L., and Karne, R. K. A VoIP Softphone on a Bare PC, ICC 2007.
62. Khaksari, G. H., Wijesinha, A. L., Karne, R. K., He, L., and Girumala, S. A Peer-to-Peer Bare PC VoIP Application. In *Proc. IEEE Consumer and Communications and Networking Conference,* Las Vegas, Nevada, January 2007.
63. He, Long., Karne, R.K., Wijesinha, A.L., Girumala, S., Khaksari, G. "Design Issues in a Bare PC Web Server", SNPD 06, 7th ACIS International Conference, Los Vegas, June 2006.
64. Karne, R.K, Venkatasamy, K., and Ahmed, T. DOSC: Dispersed Operating System Computing, OOPSLA 2005, Onward Track, San Diego, CA, October 2005.
65. Karne, R.K, Venkatasamy, K., and Ahmed, T. How to run C++ applications on a bare PC, Proceedings of SNPD 2005, 6th ACIS International Conference, Towson University, Towson, MD, May 2005, p50-55.
66. A. L. Wijesinha, R. Karne et.al, "Performance Measurements on a Multi-Service Router", in Communication Systems and Networks (CSN), 2004.

67. Bishop, T., and Karne, R.K., A Survey of Middlewares, 18th International Conference on Computers and Their Applications, March 26-28, 2003, Honolulu, Hawaii.
68. Karne, R.K., Gattu, R., Dandu, R., Zhang, X., and Vodela, J., Application-oriented Object Architecture: A Revolutionary Approach, Poster Paper, 6th International Conference on High Performance Computing, December 16-19, , Bangalore, India, 2002.
69. Karne, R.K., Gattu, R., Dandu, R., Zhang, X., and Vodela, J., Application-oriented Object Architecture: Concepts and Approach, IASTED International Conference, Networks, Parallel and Distributed Processing and Applications (NPDPA 2002), Tsukuba, Japan, October 2002.
70. Karne, R.K., and Wijesinha, A. L., An Architecture for a Web-based Electronic Book, The Sixth Biennial World Conference on Integrated Design & Process Technology, Pasadena, CA, June 2002
71. Wijesinha, A. L., and Karne, R.K., et.al. A Simulator for Measuring Satellite Terminal Management Server Load, WMC 2001 Conference, Phoenix, AZ, January 2001.
72. Karne, R. K., Wijesinha, A. L., Mahendra Patel, Arun K. Sood, and Robert Simon. Distributed Simulation of a SS7 Signal Network, International Conference on Information Reuse and Integration, Honolulu, Hawaii, November 1-3, 2000.
73. Wijesinha, A. L., Karne, R. K., Huang, X., Hong, W. Metrics Difference Measurements for C++ and Java Programs, Proceedings of the IASTED International Conference, Software Engineering and Applications, SEA'99, October 6-8, 1999-Scottsdale, Arizona.
74. Karne, R. K., Wijesinha, A. L., Huang, X., Zhao, S., Kartha, K., and Trichur, V. S. A Graph Model for Relating Software Design Objectives and Object-oriented Metrics Measurements, The Association of Management and the International Association of Mangement, 17nth Annual International Conference, San Diego, California, August 6-8, 1999, p230-235.
75. Wijesinha, A. L., Karne, R. K., Huang, X., Zhao, S., Kartha, K., Rosenberg, L., Stapko, R., Parizer. P. Metrics Differences in C++ and Java, Proc. OTC Fourth Annual Conference, 1999, Baltimore, MD.
76. Karne, R. K., Wijesinha, A. L., Lu, Y., Chen, G., Sun, Y. Java Implementation of an Object-oriented Software Metrics Assessment Tool, Proceedings of the ISCA 14nth International Conference, Computers and their Application, Cancun, Mexico, April 1999, p350-353.
77. Karne, R. K., Baras, J. S, Nau, D. S., Ball, M. O., Lin, E., Trichur, V. S., Dandekar, S., Poluri, S., and Williams, J. T., Web-It-Man: A Web-based Integrated Tool for Manufacturing Environment, 18nth Computers in Engineering Conference, September 1998.
78. Dandekar, S. V., and Karne, R. K., Commercially Available Solutions to Address Heterogeneous Database Environment, The International Association of Management, Computer Science Division, Chicago, Illinois, August 1998.
79. Karne, R. K., Atallah, G. C., Sood, A. K., Wijesinha, A. L., Lu, Y., Chen, G., and Lankford, E., L. E., Web-based Simulation Architecture for Intelligent Network Applications, Proceedings of the IASTED International Conference Modeling and Simulation, May 13-15, 1998, Pittsburg, PA, p549-p552.
80. Karne, R. K., Wijesinha, A. L., Lu, Y., Chen, G., Sun, Y., Rosenberg, L. H., and Hyatt, L. E., Object-oriented Software Metrics and Software System Goals, Proceedings of the IASTED International Conference Modeling and Simulation, May 13-15, 1998, Pittsburg, PA, p553-p555.
81. Karne, R. K., and Bradley, J., Global Object Addressing Scheme for Distributed Object Computing, The International Association of Management, Computer Science Division, Montreal, Canada, August 1997.
82. Karne, R. K., and Bradley, J., An Object Addressing Scheme for Global Object-oriented Computing, Proceedings of the IASTED International Conference Modeling and Simulation, May 1997.

83. Karne, R. K., and Bradley, J., A Global Computing Architecture: A Revolutionary Approach for Global Computing of the Future, International Association of Management, 14nth Annual International Conference, Toronto, August 1996.
84. Baras, J. S., Ball, M. O., Karne, R. K., Kelley, S., Jang, K. D., Pleasant, C., Rousspoulos, N., Stathatos, K., Vakhutinksy, A.,Vallueri, J. B., and Whitefield, D., Hybrid Network Management, 16nth International Comm. Satellite Systems Conference, Washington, D.C., Feb 1996.
85. Ball, M. O., Baras, Karne, R. K., Atallah, G. C., Jang, Kap., Valluri, J. B., Whitefield, D., and Wei, H., Integrated Network Management System for Hybrid Networks, Space Technology & Applications, Albuquerque, NM, January 1996.
86. Ball, M. O., Baras, J. S., Bashyam, S., Karne, R. K., Trichur, V. S., Townsley, M., Karir, M., Xie, Hui, and Inbar, A., Decision Making Assistant for Integrated Product and Process Design Environment, Symposium on Timely Realization of Affordable Military Systems Through Enhanced Manufacturing Technology, October 1995.
87. Ball, M. O., Baras, J. S., Bashyam, S., Karne, R. K., and Trichur, V. S., On the Selection of Parts and Processes during Design of Printed Circuit Board Assemblies, Inria/IEEE Conference on emerging technologies and factory automation, October 1995.
88. Atallah, et.al., Object Oriented Hybrid Network Simulation, Technology 2004.
89. Atallah, et.al., Next Generation Network Management Technology, 10th Symposium on Space Nuclear Power and Propulsion, Albuquerque, New Mexico, January 1995.
90. Karne, R. K., and Sood, A. K., SNARS: A Semantic Network Architecture for Rule-based Simulations, European Workshop on Parallel Computing, EWPC92, March 1992.
91. Karne, R. K., and Sood, A. K., A Parallel Architecture for Rule-based Simulations, Proceedings of the 1991 International Simulation Technology Conference, October 1991, Twin Towers Hotel, Orlando, Florida, p386-p391.
92. Karne, R. K., and Sood, A. K., A Knowledge Representation Based Parallel Architecture for Rule-based Simulation Applications, Conference Proceedings, 1991 IEEE Conference on Systems, Man, and Cybernetics, Charlottesville, Va, October 1991, p1895-p1900.
93. Karne, R. K., and Sood, A. K., A high-level parallel architecture for a rule-based system, SPIE Technical Conference on Applications of Artificial Intelligence, Orlando, Florida, April 1991.

**<u>Research Grants Awarded As PI</u> ($701,235)**

1. Coracias Advanced Tech, Grant $30,782 funded one GA full-time
2. Accurate Computer Services Inc. $2852, January 2006.
3. REU from NSF, 2004-2007, $225,000.
4. A Testbed for Megaxess's Quality of Service Router (QoSR) Phase II, Megaxess Inc., and Maryland Industrial Partnership (MIPS), January 2002 – December 2002, $70,008.
5. Application-oriented Object Architectures, SGER, NSF Grant, $84, 501, September 01 through August 2003.
6. Graduate student work at Morgan State University, School of Engineering, September 2001, May 2002, $13,596.
7. A Testbed for Megaxess's Quality of Service Router (QoSR), Megaxess Inc., and Maryland Industrial Partnership (MIPS), February 2001 – January 2002, $61,636.
8. A Testbed analysis work, Megaxess, $2500, Sept 2000 – August 2001.
9. Virtual Job Fair System, KCS International Inc., June – December 2000, $6654.
10. We-based Software Development for RMR System, Arbitron Corporation and Maryland Industrial Partnership (MIPS), August 1999, July 2000, $41,701.
11. System Integration and Graphical User Interface, Arbitron Corporation, Columbia, MD, September 1, 98 – February 28, 1999, amount $20,232.
12. Enhancements to Toom, NASA/Unysis Corporation, September 1, 98 – June 30, 1999, amount $22,462.

13. Study of Metrics Differences in C++/Java Programs, NASA/Unysis Corporation, January 98 - December 1998, amount $8,844.
14. Extension of OO Metrics Tool, NASA, January 99 - December 1998, amount $6,450.
15. Object-oriented Metrics Measurement Tool for Java Programs (four metrics), NASA, September 97 - January 1998, amount $6,458.
16. Enhancement of OO Metrics Tool for C++ programs, NASA, August 97- May 1998, amount $4,172.
17. OODBMS, ObjectStore, Software Grant, Institute for Systems Research, College Park, MD, January 1997, amount $600.
18. Integrating Database Teaching and Learning Environment with Database Application of Manufacturing, University of Maryland State Department and University of Maryland System, June 1997, amount $2,500.
19. A Tool to Calculate OO Metrics for C++ code, NASA, June 1997, amount $3,540.
20. Software Engineering Assessment Tool Using Multi-Objective Optimization, NASA, January 1997, amount $8,676.
21. Intelligent Networks and Network Management Systems, National Security Agency, and George Mason University, partial award to Towson State University, one year, October 1997, amount $32,000.
22. Intelligent Networks and Network Management Systems, National Security Agency, and George Mason University, partial award to Towson State University, one year, July 1996, amount $8000.
23. Integrated Product and Process Design Automation Tool for Manufacturing Microwave Modules: Phase II, Northrop-Grumman, and Institute for Systems Research, partial award to Towson State University, one year, August 1997, amount $10,983.
24. Integrated Product and Process Design Automation Tool for Manufacturing Microwave Modules, Maryland Industrial Partnership, Northrop-Grumman, and Institute for Systems Research, partial award to Towson State University, one year, May 1996, amount $7088.

**Research Grants Awarded As CO-PI or Investigator ($281,341)**

**1.** Solipsys: Tech Component Network, Solipsys Corporation, $50,000, April – July 2000.

**2**. Simulation Study of STEM Server Load in Spaceway System, Hughes Network Systems, February – June 2000, $14,997.

**3**. Integrated Product and Process Design Automation Tool for Manufacturing Microwave Modules, MIPS, and Westinghouse Corporation, October 1995, $97,941.

**4**. Productibility and Manufacturability of High-Power Surveillance T/R Modules, MIPS and Westinghouse Corporation, 1994, $118,403.

**Research Proposals Written**

NSF proposals such as SHF, Trusted Computing, Embedded Systems, ITR, SGER, ILI, CCD, Career, RUI, and ARPA; Maryland Industrial Partnership (MIPS), NSA, Northrop Grumman, Hughes, etc.

**Collaborations**

George Mason University, Morgan State University, UMD College Park and Industry.

**Patents**

**1**. Karne, R. K., Wijesinha, A.L, and Khaksari, G. Systems and Methods for performing bare machine applications, filed February 1, 2008 (Not approved).

**2**. Karne, R. K., and Vedula Sastry, Data Processor having multiple execution units for processing plural class of instructions in parallel, U. S. Patent No. 5,133,077, July 21, 1992.
**3**. Matyas, S., Karne, R. K., et.al., DEA Based Secure Management for Computer Systems, U. S. Patent No 5,103,478, April 7, 1992.
**4**. Matyas, S., Karne, R. K., et.al., Secure Management of Keys Using Control Vectors, U. S. Patent No 4,941,176, July 7, 1990.
**5**. Matyas, S., Karne, R. K., et.al., Personal Identification Number Processing, U. S. Patent No 4,924,514, May 8, 1990.
**6**. Matyas, S., Karne, R. K., et.al., Secure Management of Keys Using Extended Control Vectors, U. S. Patent No 4,924,515, May 8, 1990.
**7**. Matyas, S., Karne, R. K., et.al., Data Cryptography operations Using Control Vectors, U. S. Patent No 4,918,728, April 17, 1990.

## IBM Technical Disclosures

**1**. Matyas, S., et.al., A Method of Thwarting Cryptographic Information, IBM Technical Disclosure Bulletin, BT8920029, IBM, 7-31-1992.
**2**. Karne, R. K, et.al., A new approach to eliminate branch cost, IBM Technical Disclosure Bulletin MA8860109, IBM, 1-09-1990.
**3**. Matyas, S., et.al., DEA Based Pseudorandom Number Generator, IBM Technical Disclosure Bulletin MA8880187, IBM, 7-05-1989.
**4**. Matyas, S., et.al., Initialization Procedure for DEA-Based System, IBM Technical Disclosure Bulletin MA8880188, IBM, 7-05-1989.
**5**. Matyas, S., et.al., Verification of Manually Inserted Keys, IBM Technical Disclosure Bulletin MA8880195, IBM, 7-05-1989.
**6**. Matyas, S., et.al., Archival of cryptographic keys using control vectors, IBM Technical Disclosure Bulletin MA8880196, IBM, 7-05-1989.
**7**. Matyas, S., et.al., A passphrase filter for detection/rejection of keys, IBM Technical Disclosure Bulletin MA8890197, IBM, 7-05-1989.
**8**. Matyas, S., et.al., A method for proving cryptographic security, IBM Technical Disclosure Bulletin MA8880208, IBM, 7-05-1989.
**9**. Matyas, S., et.al., A method for employing dynamic PIN encryption, IBM Technical Disclosure Bulletin MA8880209, IBM, 7-05-1989.
**10**. Karne, R. K, et.al., Low Voltage Integrated Regulated Circuit, IBM Technical Disclosure Bulletin, MA8860113, IBM, 2-16-1987.
**11**. Karne, R. K, et.al., Look-ahead and Instruction Operand Queue, IBM Technical Disclosure Bulletin, MA8850211, IBM, 2-16-1987.
**12**. Karne, R. K, et.al., Register and Operand Conflict Interlock, IBM Technical Disclosure Bulletin, MA8860006, IBM, 4-03-1987.
**13**. Karne, R. K, et.al., On Chip Monitor, IBM Technical Disclosure Bulletin, MA8850113, IBM, 12-31-1986.

## Technical Reports

**1**. Karne, R. K., and Sood, A. K., SNAMP: A High-level Parallel Architecture for a Rule-based System, George Mason University, School of Information Technology, Fairfax, VA 22030, Technical Report No. IA-91-3, March 1991.
**2**. Karne, R. K., Parallel Sorting Simulation, IBM Technical Report Publications, TR63.0227, July 1988.
**3**. Karne, R. K., Design Issues and Criteria in Artificial Intelligence, IBM Technical Report Publications, TR63.0219, June 1988.
**4**. Karne, R. K., Parallel Architecture Simulation, IBM Technical Report Publications, TR63.0213, February 1988.

**5.** Karne, R. K., A Large Computer Design Methodology Using a Systems Engineering Approach, IBM Technical Report Publications, TR63.0197, July 1987.

## Professional Participation

IJCA, IASTED, Sigma-Xi, ACM, and IEEE.

## Awards

- Promoted to Professor, August 2003.
- Excellence in Scholarship Award, October 2000.
- Promoted and tenured, August 1999.
- IBM Resident Study Program; time off for two years with full pay and benefits to complete Ph.D. One additional semester off with full pay to complete course work.
- Second Plateau Invention Achievement Award at IBM, August 1989.
- First Plateau Invention Achievement Award at IBM, October 1988.

## Service Activities

- Graduate program director August 2010 – April 1, 2011
- Served as doctoral program director February 2004 – August 2009
- Served as doctoral program director August 2013 – August 2016
- Associate chair October 2002- August 2004
- Graduate program director February 1999 – May 2004
- College council member (3 years)
- Active participant in curriculum committee
- Server as member of assessment and quality committee
- Advised graduate and undergraduate students.
- Provided graduate research assistantships
- Supervised graduate students' projects
- Supervised graduate thesis
- Developed many new courses
- Participated in department mission proposal
- Involved with other faculty in team projects.
- Reviewed database management systems book (Elmasri & Navathe 3rd Edition), acknowledged by the authors in the book.
- Supervised 65 graduate projects
- Directed nineteen doctoral dissertations and co-directed eight (All of these are based on Bare Machine Computing Paradigm in collaboration with Dr. Alexander L. Wijesinha).