Curriculum Vitae

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Personal statement

Teaching is the principal activity for all faculty members at any university. Teaching includes appropriate work and involvement with students within the classroom and beyond. In my opinion students are most successful when they feel valued as individuals, supported, and motivated to learn. As a teacher, it is my responsibility to create and maintain a learning environment with these things in mind.

I am sure accomplished teachers have a deep understanding of their subject areas and the issues that are likely cause for the students to be more effective. Having identified the problem areas they try to help students cope with them. Moreover, they are also aware that there are multiple paths to learning any subject and help each student find the right path to that education. I try to teach students how to think rather than what to think. I do not treat my students simply as empty vessels waiting to be filled with

knowledge. Rather, I do my best to engage them actively with the teaching process, to be challenged to apply the knowledge in the solution of a variety of practical problems, to find different solutions of a given problem, and always to make a link with the things that they know. My goal is to help students to learn to reason logically, and to encourage their creative thinking.

I continuously try to capture the student's attention and interest. I talk to my class rather than to the board and make eye contact with my students to encourage the attentive and discourage the inattentive students. I keep my style conversational whenever possible, vary my tone according to the importance of the material, and allow regular feedback from the students. I keep my students involved, and hopefully interested in what is happening in class. Whenever relevant, I include amusing stories that are linked to principles I want to convey, thereby leaving the students with something more to remember it by. Finally, I strongly encourage my students to see me during office hours for more individualized help.

Teaching effectiveness is a complex social process. I believe that measuring of teaching effectiveness should be not done only by instructor evaluation form, but also by evaluations of activities directly related to teaching, such as teaching innovations, course development and revision, syllabus preparation, and tutorial/laboratory assistance.

The role of technology in effective teaching is beyond any question nowadays. Technology ranges from pencils and paper through computers, the internet and beyond. Since modern technologies create new opportunities for learning, our profession will accept them without neglecting the value of older practices. In computer courses use of additional teaching aids and skills play valuable role. It is difficult to imagine a teacher writing a program code or drawing a complicated electronic scheme on the board and trying to explain the way they work. Use of modern and up-to-date technologies, such as demonstration power point slides, electronic copy of the lecture notes and running the executable programs right in the class, and use of modern auxiliary teaching aids like data projector, overhead projector and computer is the way which leads to increase of teaching effectiveness. Availability of the Internet connection in the classroom and easy access electronic documents related to the course subject increases the teaching effectiveness in computer classes. I do believe, on the other hand, freshman year courses in basic sciences should be taught using chock and board.

The effective communication is essential for the teaching process. Instructor – student interaction through web by homepages brings up teaching to up-to-date level. Homepages provide practical learning environment for the students. A homepage composed of all course items including course outline, assignments, homeworks, exam questions as well as solutions to exam questions, electronic version of the lecture notes, announcements, and other satellite information is a good communication skill for both teachers and students. When necessary, students should be able to keep teacher in

touch by email - send and receive electronic messages to/from the teacher. All of above a step toward self-learning environment, which is commonly called distance education. I believe a reasonable composition of various teaching aids and skills makes a student enthusiastic about the subject.

As a teacher, we often go into our classrooms without knowing what other teachers are doing and thinking. Collaboration between teachers is important especially in multigroup courses. A multigroup course should be presided over by a coordinator. The coordinator should keep track of convening the colleagues and guiding discussions, being responsible for the contribution of the colleagues to the preparation of the quizzes, assignments, exams, and preparing class schedules.

These were classroom strategies I observed and valued during my teaching experience at Eastern Mediterranean University for some twenty years. My research interests are related mostly to bioinformatics, Petri nets, quantitative and qualitative modeling of dynamic systems, parallel processing, interconnection networks, and cryptography & information security.

I started my research carrier in 1984 yet as a Ph.D. student specializing in the field of parallel processing and interconnection networks. Parallel processing at that time was among hot areas of computer science. I was particularly interested in design of regular and irregular parallel algorithms, mapping algorithms into architecture of parallel computers, and analyzing the rearrangeable multistage and recirculating networks. I spent years to investigate the universality of shuffle-exchange type networks. The main result, which came to the end of 90s, is the proof of rearrangeability of (2logN-1)-stage shuffle exchange network, an open problem for almost 30 years. This result was published in two reputable journals and proceedings of three international conferences.

In the beginning of 2000s I initiated research on application of Petri nets with extension to problem solving. The two most significant results are application of colored Petri nets to analysis of permutation capability in multistage interconnection networks and reducing path-dependent loss and switch crosstalks in optical interconnection networks. The research covers several presentations in international conferences, and three SCI journal papers.

Last years, we focus our attention on application of Petri net technologies in quantitative modeling of complex biological processes. Together with my collaborators we have created quantitative explanatory model of p16-mediated pathway. Understanding functional dependence between dynamic behavior of biological components involved in the p16-mediated pathway and related molecular-level events might suggest possible implications in the diagnosis, prognosis and treatment of human cancer. We implemented experimental data from the literature to validate the model, and under various assumptions predict the dynamic behavior of p16 and other biological components by interpreting the simulation results. We are presently working on quantitative models of melanoma, a malicious form of skin cancer, Petri net based

classification of beta-globin gene mutations and its application in study of a group of genetic blood disorders known as thalassemia. The results are published in three SCIE journals, and were presented in several international conferences.

An integral part of the work of a faculty member is support of the life of the university. To me the service activities of the faculty member can be easily classified as the services, which can be easily given by any faculty member, and those expected to be carried out by active and enthusiastic faculty members. The former includes items such as committee assignments within department and student advising, while the latter is a collection of remaining service activities including responsibilities held in faculty-level or even university-level committees, commissions, groups, and other units, membership in student outreach programs, etc. In my opinion, all faculty members should contribute by taking part in committees and commissions organized within department. On the other hand, student advising is an inherent part of the life of the department, and it is a faculty member's responsibility to help students as an advisor. Service activities of the second type, on the other hand, are more important when we need to measure a faculty member's service activities.

Education and Degrees:

- Senior Research Fellowship Diploma in Computer Science, High Education Board, Azerbaijan, Baku, 1996.
- PhD in Computer Science, Moscow State University, 1990.
- MSc in Applied Mathematics, Azerbaijan State University, 1982.

Academic positions held:

- Professor   EMU   2010-
- Associate Professor   EMU   1997-2010
- Assistant Professor   EMU   1993-1997

Employment:

- 2010 - now, Professor, Department of Applied Mathematics and Computer Science, Eastern Mediterranean University, Famagusta, North Cyprus
- 1997 – 2010, Associate Professor, Department of Applied Mathematics and Computer Science, Eastern Mediterranean University, Famagusta, North Cyprus
- 1993 – 1997, Assistant Professor, Department of Applied Mathematics and Computer Science, Eastern Mediterranean University, Famagusta, North Cyprus
- 1990 – 1993, part-time lecturer, Department of Mathematical Cybernetics, Baku State University, Baku, Azerbaijan
- 1992 – 1993, Head of Department, Institute of Cybernetics, National Academy of Sciences, Baku, Azerbaijan

- 1991 – 1992, Senior Research Fellow, Institute of Cybernetics, Azerbaijan National Academy of Sciences, Baku, Azerbaijan
- 1990 – 1991, Research Fellow, Institute of Cybernetics, Azerbaijan National Academy of Sciences, Baku, USSR
- 1984-1986, Graduate Employee, Institute of Computer Mathematics, USSR Academy of Sciences, Moscow, USSR
- 1982 – 1984, Minor Research Fellow, Institute of Cybernetics, Azerbaijan National Academy of Sciences, Baku, USSR

Administrative duties:

- Dean, Faculty of Arts and Sciences, EMU, North Cyprus   2010 -
- Vice Dean, Faculty of Arts and Sciences, EMU, North Cyprus   2005 - 2010
- Vice Chair, Department of Mathematics, EMU, North Cyprus   1997 - 2005
- Head of Department, Institute of Cybernetics, Baku, Azerbaijan   1992 - 1993

Research interests:

- Bioinformatics
- Petri nets
- Switching Theory
- Interconnection Networks
- Concurrency Theory
- Parallel Processing
- Cryptography and Data Security

Teaching activities:

Undergraduate courses taught

- Introduction to Computer Science I (COMP181)
- Introduction to Computer Science II (COMP182)
- Design and Analysis of Algorithms (COMP285)
- Object Oriented Programming (COMP275)
- Data Structures (COMP286)
- Operating Systems (COMP483)
- Operating Systems and Their Applications
- Mathematics for Business and Economics I (MATH103)
- Mathematics for Business and Economics II (MATH104)
- Linear Algebra (MATH106)
- Basic Mathematics I (MATH111)
- Basic Mathematics II (MATH112)
- Mathematical Logic of Computers (MATH161)
- Discrete Mathematics (MATH163)
- Numerous area elective courses

Graduate courses taught

- Cryptography and Data Security (COMP586)
- Petri Nets: Theory, Analysis Methods and Applications (COMP544)
- Algorithms on Graphs (ISYS505)
- Parallel Methods and Models (ISYS507)
- Network Data Security (ISYS515)
- Theory of Algorithms (COMP512)
- Theory of Graphs (COMP551)
- Combinatorics (COMP552)
- Parallel Processing (COMP558)

Thesis supervision:

PhD theses supervised

1. İlke N. Çetin, Implementing Petri net technologies for quantitative modeling of p-16 centered melanoma signaling pathways (continuing)
2. Mani Mehraei, Modeling of β-globin gene mutations and its impact in diagnosis of β- thalassemia (continuing).
3. Recep Duranay, Quantitative modeling of cancer pathways with hybrid functional Petri nets (continuing)
4. Tolgay Karanfiller, Exploiting Petri nets to reduce switch crosstalk and path-dependent loss in optical interconnection networks, December 2011.
5. Hüseyin Lort, Analysis of permutation admissibility with CP-nets, December 2009.

Master theses supervised

1. Alma Krivdic, Comprehensive analysis of mathematical and computational models of cell cycle (continuing).
2. Gülbahar Akgün, Performance Analysis of Hill cipher and Its Modifications, February 2015.
3. Fatma Dolma, Implementing Petri Nets for Modeling and Simulation in Biosciences, January 2012.
4. Firdevse Kayımzade, Primality test algoriıthms, February 2004.
5. Olga Pilli, Modeling interconnection networks with Petri nets, August 2000.
6. Mustafa Babagil, Survey on containment of interconnection networks, September 1997.
7. Fatma Belkıs Yüce, On rearrangeability of 5-stage interconnection networks, August 1996.
8. Ahmet Bilgen, Rearrangeable butterfly type interconnection networks, February 1995.
9. İlker Esener, Efficient mapping of parallel algorithms based on recursive doubling scheme, September 1994.

10. Rüşdiye Gürbüz, Efficient mapping of class of parallel algorithms into interconnection networks, September 1994.

Publications:

Articles in refereed international journals

1. Mehraei, M., Bashirov, R., Tüzmen, Ş. (2015) Comparative analysis of strategies for fetal hemoglobin induction based on quantitative modelling with Petri nets, *Journal of Bioinformatics and Computational Biology*, Imperial College Press, (submitted) (indexed in SCIE).
2. Akçay, İN., Bashirov, R., Tüzmen, Ş. (2015) Validation of signalling pathways: case study of the p16-mediated pathway, *Journal of Bioinformatics and Computational Biology*, Imperial College Press, 13(2) DOI: 10.1142/S0219720015500079 (indexed in SCIE).
3. Bashirov, R., Karanfiller, T. (2010) On path dependent loss and switch crosstalk reduction in optical networks, *Information Systems*, Elsevier, 180, 1040-1050 (indexed in SCI).
4. Bashirov, R., Kordon, F., Lort, H. (2009) Exploiting colored Petri nets to decide on permutation admissibility, *Acta Informatica*, Springer Berlin/Heidelberg, 46, 43-55 (indexed in SCI).
5. Bashirov, R., Crespi, V. (2006) Analyzing permutation capability of multistage interconnection networks with colored Petri nets, *Information Sciences*, Elsevier, 176, 3143-3165 (indexed in SCI).
6. Bashirov, R. (2001) Rearrangeability of 2log-1 stage networks employing a uniform connection pattern, *Calcolo*, Springer Verlag, 38, pp. 85-95 (indexed in SCIE).
7. Bashirov, R. (2000) On the rearrangeability of Multistage Interconnection Networks Employing Uniform Connection Pattern, in: *Proc. 1st Biennial Conference on Advances in Information Systems*, Izmir, 25-27 October, 2000, *Lecture Notes in Computer Science*, Springer Verlag, 1909, pp. 170-180 (indexed in SCIE).
8. Bashirov, R. (1999) Analysis of rearrangeable single-stage interconnection networks, *Transactions of National Academy of Sciences of Azerbaijan*, *Series of Physical-Technical and Mathematical Sciences,* 19 (3-4), 1999, 166-171 (indexed in AMS).
9. Bashirov, R. (1993) On the mapping some regular and irregular parallel algorithms, *Transactions of National Academy of Sciences of Azerbaijan. Series of Physical-Technical and Mathematical Sciences* 14, 1993, 63-69 (indexed in AMS).

Articles in proceedings of refereed international conferences

1. Bashirov, R., The integrated modelling of biological processes with differential equations and Petri nets, in: *Proc. 11th Inter Conf Applications of Fuzzy Systems and Soft Computing*, Rouen, France, 2-3 September, 2014, pp. 47-55.
2. Bashirov, R., Mathematical modelling of cell cycle regulation with differential equations, in: *Proc. Applications of Mathematics and ICT - New Training Technologies*, Vol.2, Ganja, 5-6 June, 2014, pp. 181-184.
3. Çetin, İ., Bashirov, R., Tüzmen, Ş., Petri net based modelling and simulation of p16-Cdk4/6-Rb pathway, in: *Proc. 4th International Workshop on Biological Processes and Petri nets*, CEUR, Vol. 988, Milan, 24-25 June, 2013, pp. 30-44.
4. Bashirov, R., Karanfiller, T., Lort, H., An approach to reduce path-dependent-loss in optical networks implementing Petri nets, in: *Proc. 8th International Conference on Application of Fuzzy Systems and Soft Computing*, Quadrat Verlag, Helsinki, 1-3 September, 2008, pp. 91-96.
5. Bashirov, R., On admissability of permutations to hybrid optical interconnection networks with minimum number of stages, in: Proc. 4th International Conference on Soft Computing, Computing with Words and Perceptions in System Analysis, Decision and Control, Antalya, Turkey, 27-28 August, 2007, pp. 309-315.
6. Bashirov, R., Lort, H., A study of permutation admissability with colored Petri nets, in: *Proc. 3rd International Symposium on Electrical, Electronic and Computer Engineering*, Nicosia, North Cyprus, November 23-25, 2006, pp. 91-95.
7. Bashirov, R., Qualitative analysis of permutation capability through exploiting place invariants in colored Petri nets, in: *Proc. 7th International Conference on Application of Fuzzy Systems and Soft Computing*, Quadrat Verlag, Siegen, Germany, 13-14 September, 2006, pp. 106-112.
8. Bashirov, R., The essence of primality test in information security, in: *2nd International Conference on Business, Management and Economics*, Çeşme-İzmir, Turkey, 16-18 June, 2006.
9. Bashirov, R., Crespi, V., Qualitative analysis of permutation capability with colored Petri nets, in: *Proc. 13th IEEE Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems*, IEEE Press, Atlanta, 27-29 September, 2005, pp. 463-470.
10. Bashirov, R., Using extended HCPN modeling for investigating the permutation capability of multistage interconnection networks, in: *Proc. 3rd International Conference on Soft Computing, Computing with Words and Perceptions in System Analysis, Decision and Control*, Quadrat Verlag, Antalya, 1-2 September, 2005, pp. 226-236.
11. Bashirov, R., Information security and cryptographic techniques, in: *Proc. 1st International Conference on Business, Management and Economics in a Changing World*, Ceşme, 16-19 June, 2005.
12. Bashirov, R., Analyzing multistage interconnection networks with hierarchical Petri nets, in: *Proc. 6th International Conference on Application of Fuzzy Systems*

and Soft Computing, Quadrat Verlag, Barcelona, 28-30 September, 2004, pp. 232-239.

13. Bashirov, R., Lort, H., Analyzing permutation capability of multistage interconnection networks with colored Petri nets and Design/CPN, in: *Proc. 2nd International Conference on Soft Computing and Computing with Words in System Analysis, Decision and Control*, Quadrat Verlag, Antalya, 9-11 September, 2003, pp. 197-207.

14. Bashirov, R., Using Petri net for analysis of permutation capability in multistage networks, in: *Proc. International Conference Parallel and Distributed Processing Techniques and Applications*, CSREA Press, Vol. 1, Las Vegas, 25-28 June, 2001, pp. 226-231.

15. Bashirov, R., On the rearrangheability of 2s-1 stage nonsymmetric interconnection networks, in: *Proc. International Conference Parallel and Distributed Processing Techniques and Applications*, CSREA Press, Vol. 2, Las Vegas, 26-29 June, 2000, pp. 907-913.

16. Bashirov, R., Combinatorial model of the class of rearrangeable nonsymmetric interconnection networks. in: *Proc. International Conference Parallel and Distributed Processing Techniques and Applications*, CSREA Press, Vol. 2, Las Vegas, 26-29 June, 2000, pp. 891-899.

Chapters in refereed books

1. Bashirov, R., Mapping of some sorting algorithms into architecture of rearrangeable single stage interconnection networks, Computer Architecture and Numerical Methods (Ed. V. Voyevodin), USSR Academy of Sciences, 1990, 3-12.

2. Bashirov, R., Realization of some graphs on rearrangeable interconnection networks, Computer Architecture and Numerical Methods (Ed. V. Voyevodin), USSR Academy of Sciences, 1988, 15-25.

3. Bashirov, R., Routing algorithm for a class of universal interconnection networks, Computer Architecture and Numerical Methods (Ed. V. Voyevodin), USSR Academy of Sciences, 1987, 35-44.

4. Bashirov, R., On the universality of shuffle-exchange networks, Computer Architecture and Numerical Methods (Ed. V. Voyevodin), USSR Academy of Sciences, 1985, 3-15.

Articles in proceedings of refereed national conferences

1. Bashirov, R., Combinatorial model of an optimal nonsymmetric multistage interconnection networks, In: Proc. 7th Symposium of Turkish Mathematical Society, 29 August – 2 September, Bilkent University, Ankara, 1994, 33-47.

2. Bashirov, R., Esener, I., Gürbüz, R., Two efficient mapping methods for parallel algorithms, In: Proc. 7th Symposium of Turkish Mathematical Society, 29 August – 2 September, Bilkent University, Ankara, 1994, 171-185.

3. Bashirov, R., On the mapping of some parallel numerical methods. In: Proc. 6th Symposium of Turkish Mathematical Society, EMU, Gazimagosa, 8-12 September, 1993, 161-171.

Presentations in conferences

1. Bashirov, R., The essence of primality test in information security, In: 2nd International Conference on Business, Management and Economics, Çeşme-İzmir, Turkey, 16-18 June, 2006.
2. Bashirov, R., Information security and cryptographic techniques, In: Proc. 1st International Conference on Business, Management and Economics in a Changing World, Ceşme, 16-19 June, 2005.

Other academic contributions:

Organized conferences

- PNTAB2008, Marseille, 2008 (PC member)
- AICCSA2008, Qatar, 2008 (PC member)
- MCU2015, North Cyprus, 2015 (PC member, Chair of Organizing Committee)

Reviewer for refereed journals

- Information Sciences (indexed in SCI)
- Computer Communications (indexed in SCI Expanded)
- Several journals of Hindawi Publishing Corporation (all indexed in SCI Expanded)