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Personal Information

Birth: May 9, 1954; Azerbaijan Republic.

Sex: Male.

Citizenship: Azerbaijan Republic.

Marital Status: Married, with one daughter (born 1988).

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Qualification

Habilitation (1992): By the Decision of the Supreme Attestation Commission of the (former) USSR (Moscow). Thesis title: *Control and Filtering for Linear Systems with Dependent Noises*, in the fields of Probability Theory and Mathematical Statistics (major), and Systems Theory (minor); defended at the faculty of Cybernetics of Kiev State University; referees: Prof. A.V.Skorokhod, Prof. A.N.Shiryayev, Prof. R.S.Liptser, Prof. A.G.Nakonechny.

Senior Research Fellow (1987): By the Decision of the Presidium of Academy of Sciences of the (former) USSR (Moscow).

PhD (1981): By the Decision of the Academic Board of the Institute of Mathematics of Ukrainian Academy of Sciences (Kiev). Thesis title: *On Stochastic Integral and Stochastic Optimal Control in Hilbert Spaces*, in the field of Probability Theory and Mathematical Statistics; defended at the Institute of Mathematics of Ukrainian Academy of Sciences (Kiev); supervisor: Prof. J.E.Allahverdiev; referees: Prof. A.V.Skorokhod, Prof. I.I.Gikhman, Dr. A.I.Ponomarenko.

BS/MS (1976): Faculty of Mathematics and Mechanics, Baku State University (with honor).

Brief Autobiography

I defended my Habilitation dissertation with the major specialty "Probability Theory and Mathematical Statistics" and minor specialty "Systems Theory" at the Faculty of Cybernetics of

the Kiev State University in 1991 being in contact with prominent mathematicians of the former Soviet Union such as A.N.Shiryayev, A.V.Skorokhod, I.I.Gikhman, R.S.Liptser, Yu.L.Daletskii, A.A.Novikov, A.V.Anisimov etc. Before I was with the Institute of Cybernetics of Azerbaijan Academy of Sciences from 1980 till 1992 and defended my PhD dissertation in 1981 at the Institute of Mathematics of Ukrainian Academy of Sciences (Kiev) with the specialty "Probability Theory and Mathematical Statistics". After receiving Habilitation degree, I joined the Department of Mathematics of the Eastern Mediterranean University and held the positions: associate professor from September 1992 till March 1994 and then professor up to present.

My main research concerns stochastic systems, specially a non-classic case of dependent noises. I am an author of 2 books. The first book (monograph) -- *Partially Observable Linear Systems under Dependent Noises*, Birkhauser, Basel, 2003, presents new powerful mathematical methods for engineering problems such as stochastic control, filtering, controllability etc. and resumes my research up to 2003. Presently, I am far ahead from these results and planning a substantial update of this monograph. My second book (textbook) – *Mathematical Analysis Fundamentals*, Elsevier, New York, 2014, is written on the basis of my different analysis based courses of graduate and undergraduate levels. I am planning the second edition of this book. During my activity in the Eastern Mediterranean University I offered many graduate and undergraduate courses, among them Probability and Statistical Methods, Stochastic Processes, Stochastic Analysis etc.

I received 2000 Outstanding Achieve Diploma and Medal awarded by International Biographical Centre, Cambridge, England, 1997, supervised 9 completed PhD and 10 MSc theses published more than 80 scientific papers and participated in many international conferences.

Teaching Experience

1992–present: Department of Mathematics, Eastern Mediterranean University (Gazimagusa), Full Professor (1994-present), Associate Professor (1992-1993). The medium of instruction at this university is English.

1980–1992: Department of Functional Analysis, Baku State University, Associate Professor, on part time base (1982-1992), Assistant Professor on part time base (1980-1981). The medium of instruction at this university is Russian/Azerbaijani.

Undergraduate courses taught: Calculus, Advanced Calculus, Complex Calculus, Probability, Probability and Statistics, Linear Algebra.

Postgraduate courses taught: Mathematical Analysis, Functional Analysis, Introduction to Stochastic Calculus, Random Processes, Introduction to Infinite Dimensional Linear Systems, Stochastic Optimal Control and Estimation, Fourier Series.

Research Experience

1992–present: Graduate Studies and Research Institute, Eastern Mediterranean University, Full Professor (1994-present), Associate Professor (1992-1993).

1976–1992: Institute of Cybernetics of Azerbaijan National Academy of Sciences (Baku), Leading Research Fellow (1989-1992), Senior Research Fellow (1985-1989) Junior Research Fellow, (1980-1985), Ph.D. student (1976-1979).

Research Fields: Stochastic Systems, Stochastic Optimal Control, Kalman Filtering, Controllability of Stochastic and Deterministic Systems, Multiplicative Calculus.

Supervision of PhD Theses

- **S.Norozpour (ongoing)** *On Complex Multiplicative Calculus.*
- **K.Abuassba (ongoing)** *Kalman Filtering under Wide Band Noises.*
- **N.H.Ghahramanlou (2015)** *Partial Approximate Controllability of Stochastic Semilinear Control Systems.*
- **M.Jneid (2014)** *Partial Complete Controllability of Stochastic Semilinear Control Systems.*
- **M.Jafari (ongoing)** *On Continued Fractions.*
- **S.F.Ertürk (2010)** *Kalman Filtering and Its Generalizations.*
- **S.Uğural (2002)** *On Reduction of Wide Band Noise Driven Systems.*
- **Y.Tandoğdu (1998)** *Estimation of Water Balance Related Parameters with Application to the Girne Range Aquifer.*
- **N.Şemi (1997)** *Prediction Problem for Linear Systems Driven by Shifted Noises.*
- **H.Etikan (1997)** *Smoothing Problem for Linear Systems Driven by Shifted Noises.*
- **L.Mishne (1990)** *Filtering Problems under Dependent Noises with Application to Designing Optimal Controls.*

Supervision of MS Theses

- **Jaafar Anwar (1914)** *Continuous nowhere differentiable functions.*
- **Twana Azeez (1914)** *Euler's Integrals.*
- **R.Dolunay (1914)** *Riemann Type Integration.*
- **M.Selimi (2012)** *Fourier series and Integrals.*
- **C.Kitaplı (2007)** *Calculus of Variations and Optimal Control.*
- **A.Özyapıcı (2005)** *Multiplicative Calculus.*
- **T.Davutoğlu (2005)** *Abstract Cauchy Problem.*
- **S.F.Ertürk (2002)** *Stochastic Calculus with Application to Finance.*
- **K.Kutoğlu (2000)** *Controllability of Deterministic and Stochastic Systems.*
- **N.Tuncalp (1999)** *On Stochastic Differential Equations.*

Miscellaneous

- **EMU Activities:** Chair of Mathematics Department of EMU (2006-2012), Member of Senate of EMU (several years), Member of Faculty Board (Arts and Sciences of EMU) (several years), Chair (2003-2006) and member (for many years) of Graduate Study Committee of Mathematics Department of EMU, Member of Curriculum Committee of Mathematics Department of EMU (for many years).
- **Accreditation and Assessment:** External reviewer of NCAAA (National Commission for Academic Accreditation & Assessment of Saudi Arabia); Reviewed Mathematics and Statistics Program of the College of Sciences with a panel of three external members during the period from 13/12/2014 to 18/12/2014.
- **Membership:** American Mathematical Society (1997-present), Planetary Society (1996), New York Academy of Sciences (1994), American Institute of Aeronautics and Astronautics (1993).
- **Editorial Work:** AMS MR reviewer, reviewer of many research journals, editor of TWMS Journal of Applied and Engineering Mathematics.
- **Awards:** Gold Medal Award of Excellence at College (Ministry of Education, Baku, Azerbaijan, 1971), 2000 Outstanding Achieve Diploma and Award (International Biographical Centre, Cambridge, UK, 1997), Merit Certificate (World Congress of Engineering, London 2-4 July, 2014), a series of publication and research awards.
- **Languages:** English, Russian, Turkish, and Azerbaijani.
- **Computer Skills:** LaTeX, MS Word, Excel etc.

LIST OF PUBLICATIONS (Agamirza Bashirov)

Books

- A.E.Bashirov, *Kalman's Three Great Contributions to Systems Theory* (in project stage).
- A.E.Bashirov, *Mathematical Analysis Fundamentals*, New York, Elsevier, 2014.
- A.E.Bashirov, *Partially Observable Linear Systems under Dependent Noises*, Basel, Birkhauser, 2003.

Journal Papers

- A.E.Bashirov, Stochastic maximum principle in the Pontryagin's form for wide band noise driven systems, *International Journal of Control*, **88** (2015), no. 3, pp. 461-468.
- A.E.Bashirov, N.Gahramanlou, On partial S-controllability of semilinear partially observable systems, *International Journal of Control*, **88** (2015), no. 5, pp. 969-982.
- A.E.Bashirov, N.Gahramanlou, On partial approximate controllability of semilinear systems, *Cogent Engineering*, **1** (2014), doi: 10.1080/23311916.2014.965947.
- A.E.Bashirov, M.Jneid, Partial complete controllability of deterministic semilinear systems, *TWMS Journal of Applied and Engineering Mathematics*, **4** (2014), no. 2, pp. 216-225.
- A.E.Bashirov, M.J.S.Belaghi, On application of Euler's differential method to a continued fraction depending on parameter, *Indian Journal of Pure and Applied Mathematics*, **45** (2014), no. 3, pp. 285-295.
- A.Özyapıcı, M.Riza, B.Bilgehan, A.E.Bashirov, On multiplicative and Volterra minimization methods, *Numerical Algorithms*, **67** (2014), no. 3, pp. 623-636.
- A.E.Bashirov, M.Jneid, On partial complete controllability of semilinear systems, *Abstract and Applied Analysis*, (2013), doi: org/10.1155/2013/521052, 8 pages.
- A.E.Bashirov, Z.Mazhar, S.Ertürk, Kalman type filter for systems with delay in observation noise, *Applied and Computational Mathematics*, **12** (2013), Issue 4, pp. 325-338.
- M.J.S.Belaghi, S.V.Khrushchev, A.E.Bashirov, On Bauer-Muir transform of continued fractions, *International Journal of Number Theory*, **9** (2013), no. 2, 321-332.
- A.E.Bashirov, Z.Mazhar, H.Etikan, S.Ertürk, Delay stricture of wide band noises with application to filtering problems, *Optimal Control, Applications and Methods*, **34** (2013), pp. 69-79.
- A.E.Bashirov, On line and double multiplicative integrals, *TWMS Journal of Applied and Engineering Mathematics*, **3** (2013), no. 1, pp.103-107.
- A.E.Bashirov, E.Mısırlı, Y.Tandoğdu, A.Özyapıcı, On modeling with multiplicative differential equations, *Applied Mathematics - Journal of Chinese Universities*, **26** (2011), no. 4, pp.425-438.
- A.E.Bashirov, M.Riza, On complex multiplicative differentiation, *TWMS Journal of Applied and Engineering Mathematics*, **1** (2011), no. 1, pp.75-85.
- A.E.Bashirov, G.Bashirova, Dynamics of literary texts and diffusion, *Journal of Communication and Media Technologies*, **1** (2011), no. 3, pp. 60-82.
- A.E.Bashirov, H.Etikan, N.Semi, Partial controllability of stochastic linear systems, *International Journal of Control*, **83** (2010), no. 12, pp. 2564-2572.
- A.E.Bashirov, E.Kurpınar, A.Özyapıcı, Multiplicative calculus and its applications, *Journal of Mathematical Analysis and Its Applications*, **337** (2008), No.1, pp.36-48.
- A.E.Bashirov, Z.Mazhar, S.Ertürk, Boundary value problems arising in Kalman filtering, *Boundary Value Problems*, doi:10.1155/2008/279410, 2008.
- A.E.Bashirov, N.Mahmudov, N.Şemi, H.Etikan, Partial controllability concepts, *International Journal of Control*, **80** (2007), no.1, pp.1-7.
- A.E.Bashirov, Filtering for linear systems with shifted noises, *International Journal of Control*, **78** (2005), no.7, pp.521-529.
- A.E.Bashirov, S.Ugural, Representation of systems disturbed by wide band noise, *Applied Mathematics Letters*, **15** (2002), pp.607-613.

- A.E.Bashirov, S.Ugural, Analyzing wide band noise processes with application to control and filtering, *IEEE Transactions on Automatic Control*, **47** (2002), pp.323-327.
- A.E.Bashirov, N.I.Mahmudov, On controllability of deterministic and stochastic systems, *SIAM Journal of Control and Optimization*, **37** (1999), no.6, pp.1808-1821.
- A.E.Bashirov, H.Etikan, N.Şemi, On duality between the control and estimation problems, *İstatistik, Journal of Turkish Statistical Association*, **1** (1998), no.1, pp.13-19.
- A.E.Bashirov, H.Etikan, N.Şemi, Filtering, smoothing and prediction for wide band noise driven systems, *Journal of the Franklin Institute, Engineering and Applied Mathematics*, **334B** (1997), no.4, pp.667-683.
- A.E.Bashirov, K.R.Kerimov, On controllability conception for stochastic systems, *SIAM Journal on Control and Optimization*, **35** (1997), no.2, pp.384-398.
- A.E.Bashirov, Control and filtering for wide band noise driven linear systems, *AIAA Journal of Guidance, Control and Dynamics*, **16** (1993), no.5, pp.983-985.
- N.I.Mahmudov, A.E.Bashirov, Optimal control of linear stochastic evolution systems, *Izvestiya Akad. Nauk Azerb. SSR, Ser. Fiz.-Tekhn.-Mat. Nauk*, **14** (1993), no.1+2, pp.2-10 (in Russian).
- A.E.Bashirov, L.V.Eppelbaum, L.R.Mishne, Improving Eotvos corrections by wide band noise Kalman filtering, *Geophysical Journal International*, **107** (1992), pp.193-197.
- A.E.Bashirov, L.R.Mishne, On linear filtering under dependent white noises, *Stochastics and Stochastics Reports*, **35** (1991), pp.1-23.
- A.E.Bashirov, On linear filtering under dependent wide band noises, *Stochastics*, **23** (1988), no.4, pp.413-437.
- A.E.Bashirov, Optimal control of partially observed systems with arbitrary dependent noises: linear quadratic case, *Stochastics*, **17** (1986), no.3, pp.163-205.
- A.E.Bashirov, A.A.Novikov, Information on International Conference on Stochastic Differential Systems, *Theory of Probability and Its Applications*, (1985), no.1, p.204 (in Russian).
- A.E.Bashirov, A problem of filtering with correlated noises, *Izvestiya Akad. Nauk Azerb. SSR, Ser. Fiz.-Tekhn.-Mat. Nauk*, **5** (1984), no.3, pp.97-102 (in Russian).
- J.E.Allahverdiyev, A.E.Bashirov, On duality between the control and interpolation problems, *Dokladi Akad. Nauk Azerb. SSR*, **11** (1984), no.6, pp.3-6 (in Russian).
- A.E.Bashirov, R.R.Hajiyev, On a controllability conception for the partially observed stochastic systems, Part 2, *Izvestiya Akad. Nauk Azerb. SSR, Ser. Fiz.-Tekhn.-Mat. Nauk*, **5** (1984), no.2, pp.99-103 (in Russian).
- A.E.Bashirov, R.R.Hajiyev, On controllability conception for the partially observed stochastic systems, Part 1, *Izvestiya Akad. Nauk Azerb. SSR, Ser.Fiz.-Tekhn.-Mat. Nauk*, **4** (1983), no.5, pp.109-114 (in Russian).
- J.E.Allahverdiyev, A.E.Bashirov, Linear quadratic stochastic optimal control under dependent random disturbances, Part 2, *Izvestiya Akad. Nauk Azerb. SSR, Ser.Fiz.-Tekhn.-Mat. Nauk*, **5** (1984), no.1, pp.86-91 (in Russian).
- J.E.Allahverdiyev, A.E.Bashirov, Linear quadratic stochastic optimal control under dependent random disturbances, Part 1, *Izvestiya Akad. Nauk Azerb. SSR, Ser.Fiz.-Tekhn.-Mat. Nauk*, **4** (1983), no.6, pp.74-83 (in Russian).
- A.E.Bashirov, N.I.Mahmudov, On stochastic integral in Banach space with a smooth norm, *Izvestiya Akad. Nauk Azerb. SSR, Ser. Fiz.-Tekhn.-Mat. Nauk*, **2** (1981), no.5, pp.47-54 (in Russian).
- A.E.Bashirov, The separation theorem for stochastic optimal control problem, *Izvestiya Akad. Nauk Azerb. SSR, Ser. Fiz.-Tekhn.-Mat. Nauk*, **1** (1980), no.3, pp.137-141 (in Russian).
- A.E.Bashirov, B.G.Karasik, Optimization problem for second order systems, *Izvestiya Akad. Nauk Azerb. SSR, Ser. Fiz.-Tekhn.-Mat. Nauk*, **1** (1980), no.2, pp.143-146 (in Russian).
- A.E.Bashirov, On stochastic maximum principle for evolution systems, *Izvestiya Akad. Nauk Azerb. SSR, Ser. Fiz.-Tekhn.-Mat. Nauk*, **1** (1980), no.2, pp.127-130 (in Russian).
- A.E.Bashirov, On stochastic differential equation in Hilbert space, *Izvestiya Akad. Nauk Azerb. SSR, Ser. Fiz.-Tekhn.-Mat. Nauk*, **1** (1980), no.1, pp.131-139 (in Russian).

- A.E.Bashirov, Infinite dimensional analogue of Dew bua Raymond's theorem, *Differentsialniye Uravneniya*, (1979), no.11, p.2088 (in Russian).

Chapters in books

- A.E.Bashirov, G.Bashirova, Literature as a Diffusion Process, in: *Brownian Motion: Elements, Dynamics and Applications*, Editors: M.A.McKibben and M.Webster, Nova Science Publications, 2015 (in print).
- A.E.Bashirov, Z.Mazhar, On asymptotical behavior of solution of Riccati equation arising in linear filtering with shifted noises, in *Mathematical Methods in Engineering*, Editors: K.Taş, J.A.Tenreiro Machado, D.Baleanu, Springer, 2007, pp.141-149.
- A.E.Bashirov, Problem Four: On Error of Estimation and Minimum of Cost for Wide Band Noise Driven Systems, in *Open Problems on the Mathematical Theory of Systems*, Editors: V.D.Blondel and A.Megretski, Princeton University Press, 2003, pp.21-24.
- A.E.Bashirov, Stochastic control and game under arbitrarily dependent noises, in *Stochastic Analysis and Related and Related Topics*, Editors: U.Çapar, A.S.Üstünel, Birkhauser, 2000, pp.1-28.
- N.I.Mahmudov, A.E.Bashirov, First order and second order necessary conditions of optimality for stochastic systems, in *Proceedings of the Steklov Mathematical Institute Seminar "Statistics and Control of Stochastic Processes"*, *The Liptser Festschrift*, Editors: Yu.M.Kabanov, B.L.Rozovskii and A.N.Shiryayev, World Scientific, 1997, pp.283-295.
- A.E.Bashirov, Linear filtering under dependent white and wide-band noises, in *Proceedings of the Steklov Mathematical Institute*, Vol.202, 1993, pp.11-24 (in Russian; translation to English is published by AMS, 1994, Issue 4, pp.7-17).
- A.E.Bashirov, Partially observed linear quadratic game with dependent random disturbances, in *Matematicheskaya Kibernetika and Prikladnaya Matematika*, No.7, Elm, Baku, 1986, pp.20-37 (in Russian).
- A.E.Bashirov, N.R.Rahmanov, L.R.Mishne, On improved model of the Kalman-Bucy filtering for computing the regime parameters of united power systems, in *Zadachi Realnogo Vremeni v Dispetcherskom Upravleni'*, Part 1, Kaunas, 1989, pp.183-186 (in Russian).

Conference papers

- A.E.Bashirov, K.Abuassba, Kalman filtering for wide band noise driven systems, *Proceedings of the 5th International Conference on Control and Optimization with Industrial Applications*, 27-29 August, 2015, Baku, Azerbaijan, 3 pages.
- A.E.Bashirov, S. Ugural, S. Erturk, Wide band noise as a distributed delay of a white noise, *World Congress on Engineering, London, UK, 2-4 July, 2008, Lecture Notes in Engineering and Computer Science*, Vol. 2, 2014, pp. 952-954.
- A.E.Bashirov, S.Uğural, On systems disturbed by wide band noise, *Proceedings of the 5th IFAC Symposium on Nonlinear Control Systems (NOLCOS 2001)*, Saint-Petersburg, Russia, July 4-6, 2001, 4 p.
- A.E.Bashirov, Control and filtering of linear systems driven by wide band noise, *Proceedings of the 1st IFAC Symposium on Systems Structure and Control*, Prague, Czech Republic, August 29-31, 2001, 6 p.
- A.E.Bashirov, On linear systems disturbed by wide band noise, *Proceedings of the 14th International Symposium on Mathematical Theory of Networks and Systems (MTNS 2000)*, Perpignan, France, June 19-23, 2000, 7 p.
- A.E.Bashirov, N.I.Mahmudov, On concepts of controllability for deterministic and stochastic systems, *Proceedings of the 38th IEEE Conference on Decision and Control*, Phoenix, Arizona, USA, December 7-10, 1999, Vol. 4, pp.3196-3202.
- A.E.Bashirov, N.I.Mahmudov, Some new results in theory of controllability, *Proceedings of the 7th Mediterranean Conference on Control and Automation (MED99)*, Haifa, Israel, June 28-30, 1999, pp.323-343.

- A.E.Bashirov, On Reduction of Wide-Band Noise Driven Linear Systems, *Abstracts of the 4th SIAM Conference on Control and Its Applications, May 7-9, 1998, Jacksonville, Florida, USA*, p.60.
- A.E.Bashirov, On weakening of the controllability concepts, *Proceedings of the 35th IEEE Conference on Decision and Control, Kobe, Japan, December 11-13, 1996, Vol.1*, pp.640-645.
- A.E.Bashirov, L.R.Mishne, On possibility of using wide band noises in the mathematical model of ship's movement under accounting of Eotvos correction, in *Problems of Ocean Bottom Geophysics, Proceedings of the 1st All Union Conference on Sea Geophysics, Moscow, 1987, Vol.2*, pp.70-71 (in Russian).
- A.E.Bashirov, L.R.Mishne, L.V.Eppelbaum, Adequacy of Kalman-Bucy filtering model in processing of aero gravimetric parameters, *Proceedings of the 4th Scientific Theoretical Conference on Oil and Gas Extracting Methodology, Baku, June 16-19, 1987, Elm*, p. 20 (in Russian).
- A.E.Bashirov, L.R.Mishne, N.I.Mahmudov, R.R.Hajiyev, Linear filtering of dependent noises, *Proceedings of the 1st All World Congress of Bernoulli Society, Moscow, Nauka, 1986, Vol.1*, p.375.
- A.E.Bashirov, R.R.Hajiyev, On sufficient condition of stochastic controllability, *4th International Vilnius Conference on Probability Theory and Mathematical Statistics, Abstracts of Communications, Vilnius, 1985, Vol. 4*, pp.21-22.
- A.E.Bashirov, On linear quadratic optimal control problem in Hilbert space with correlated random disturbances, *Proceedings of the 1st Republican Conference of Young Scientists and Specialists on Applied Mathematics and Cybernetics, Baku, Elm, 1982*, p.16 (in Russian).
- A.E.Bashirov, On stochastic integral in Hilbert space, *Proceedings of the 2nd Postgraduate Scientific Conference, Azerbaijan Academy of Sciences, Book 1, Baku, Elm, 1980*, pp.52-57 (in Russian).
- A.E.Bashirov, Linear problem of optimal control in Banach space, *Proceedings of the 1st Postgraduate Scientific Conference, Azerbaijan Academy of Sciences, Book 1, Baku, Elm, 1978*, pp.61-67 (in Russian).