Soydan Redif

Personal Information	Agios Georgios Kyrenia Cyprus, 99300.	Nationality: British Place of Birth: U.K. Date of Birth: 01/11/1972
	Tel.: +90 (0)553 860 4749 Email: sredif1@yahoo.co.uk	Web: www.soydanredif.com Skype: Soydan.redif2

Research Interests

Adaptive signal processing, blind source separation, polynomial matrix computations, parallelisation of algorithms and power(ful) systems

Education

Ph.D., Signal Processing, Electrical and Electronic Engineering, 2006
University of Southampton, Southampton, U.K.
- Thesis Topic: *Polynomial Matrix Decompositions and Paraunitary Filter Banks*
- Advisors: Prof J. G. McWhirter and Prof S. Weiss

B.Eng., Electronic Engineering, 1998
Middlesex University,London, U.K.
- *First Class Honours*

Academic Experience

Associate Professor 2016 to present
European University of Lefke (EUL), Lefke, Cyprus
Department of Electrical and Electronics Engineering

Assistant Professor 2010 to 2016
European University of Lefke (EUL), Lefke, Cyprus
Department of Electrical and Electronics Engineering

Assistant Professor 2008 to 2010
Near East University, Nicosia, Cyprus
Department of Electrical and Electronic Engineering

Industrial Experience

Senior Scientist, Technical Lead Jan. 2005 – Jul. 2007
QinetiQ, Malvern, U.K., Advanced Signal Processing Group
MoD Research Acquisition Org. project: Processing unattended ground sensors

Researcher, Coordinator, Consultant Feb. 2003 – Jan. 2006
QinetiQ, Malvern, U.K., Advanced Signal Processing Group
MoD Corporate Research Programme (CRP) project: Advanced signal processing
Won tender for and consulted on feasibility study for the Atomic Weapons Establishment

Researcher Apr. 2000 – Apr. 2004
QinetiQ, Malvern, U.K., Centre for Signal & Information Processing
CRP: Broadband advanced sensor arrays
MoD Applied Research Programme (ARP): Comms, information and signal processing

Graduate Scientist, Scientist Sep. 1998 – Sep. 2000
Defence Evaluation and Research Agency (DERA), Defford, U.K.
Satellite Communications Department
MoD ARP: Satellite communications

Teaching

Undergraduate programme responsibilities at EUL 2010–present

Courses taught:

Digital Signal Processing (4th year)
Signals & Systems (3rd year)
Electronics II (3rd year)
Control Systems (3rd year)
Electrical Materials (2nd year)
Digital Circuits (2nd year)
Digital System Design (2nd year)
Linear Algebra (1st year).

Dissertation supervision

Graduate programme responsibilities at EUL 2014–present

Courses taught

Advanced Digital Signal Processing
Digital System Design
Digital Control Systems

Ph.D. supervision

D. Hassan, *Blind channel estimation and polynomial matrix decompositions for frequency selective MIMO channels (PhD. thesis)*, European University of Lefke, Cyprus, May 2019.

M.Sc. supervision

J. Ulkareem, *Analysis of electroencephalography signals (MSc. thesis)*, European University of Lefke, Lefke, Cyprus, 2015.

S. Mohammed, *Study of FECG Extraction Methods (MSc. thesis)*, European University of Lefke, Lefke, Cyprus, Feb 2014

D. Hassan, *MIMO Encoding via the SVD (MSc. thesis)*, European University of Lefke, Lefke, Cyprus, Feb 2014.

Administrative

Accreditation 2015–2017

Contributed toward gaining professional accreditation at EUL from
ASIIN accreditation for Electronic & Communications Engineering Programme
MUDEK accreditation for Electrical & Electronics Engineering Programme

Chair, Electrical-Electronics Eng. (EEE) Department, EUL 2012–2015

Worked with Dean and Rectorate in managing the Eng. Faculty
Determined course-to-instructors program per semester
Planned & lead monthly departmental meetings
Specified and procured lab equipment and apparatus
Introduced laboratory parts to two undergraduate courses in EEE curriculum.

Awards

Project funding of £96,000, U.K. MoD 2006
QinetiQ, Advanced Signal Process. Group, Malvern, Worcs, UK.

Group Technical Achievement – EURASIP 2003
QinetiQ, Centre for Signal & Info. Process., Malvern, Worcs, UK.

I.E.E. Prize for Outstanding Academic Achievement 1999
Middlesex University, London, UK.

Best Student Award – British Telecom 1991
Southgate College, Southgate, UK.

Scholarly Activities

Session Chair May 2019
Int. Conf. Acoustics, Speech and Signal Processing (ICASSP-19)
Parahermitian Matrix Factorisations and their Applications

TCP Member
Int. Conf. Acoustics, Speech and Signal Processing (ICASSP) 2018–2019
European Signal Processing Conference (EUSIPCO) 2008–2018

Presenter Aug. 2016
The Royal Society, Chicheley, U.K.
Polynomial Matrix Decompositions and their Applications

Reviewer 2011–present
IEEE Transactions on Signal Processing
IEEE Signal Processing Letters
IEEE Transactions on Industrial Informatics
IET Signal Processing
IET Electronics Letters
Springer Circuits, Systems and Signal Processing

Professional Memberships

Chartered Engineer, MIET 2005–present
Institution of Engineering and Technology (IET)

Senior Member, SMIEET 2011–present
Institute of Electrical and Electronics Engineers (IEEE)

Chartered Mathematician, CMath 2005–2007
Institution of Mathematics-Applications (IMA).

Projects
QinetiQ
DSTL
DERA

University Defence Research Collaboration (UDRC) 2013–2018
University Defence Research Collaboration in Signal Processing
- Fruits of these projects can be found in **[7, 8, 15, 23, 25, 26, 30]**

Processing Unattended Ground Sensors – MoD RAO project 2005–2007
- **S. Redif**, S. D. Hayward, M. Cole, "DoA estimation for low cost unattended ground sensors", *Restricted, QinetiQ/D&TS Tech. Report*, 31 pages, Mar. 2007
- **S. Redif**, S. D. Hayward, M. Cole, "Techniques for low cost unattended ground sensors", *Confidential, QinetiQ/D&TS Tech. Report*, 30 pages, Mar. 2007

Advanced Signal Processing – MoD CRP project 2003–2006
- **S. Redif**, J. G. McWhirter, "Novel broadband adaptive beamformer", *Classified, QinetiQ/D&TS Working Paper*, 48 pages, May 2006
- J. G. McWhirter, **S. Redif**, T. Cooper, "Broadband adaptive sensor arrays", *Restricted, QinetiQ/D&TS Tech. Report*, 27 pages, Jun. 2005

Broadband Advanced Sensor Arrays – MoD CRP project 2002–2005
- **S. Redif**, T. Cooper, "SBR algorithm development", *Restricted, QinetiQ/D&TS Working Paper*, 40 pages, May 2003.

Communications Signal Processing – MoD ARP project 2000–2003
- **S. Redif**, I. K. Proudler, "A novel co-channel interference cancellation algorithm for single channel communications", *Confidential, QinetiQ Report*, 2003
- **S. Redif**, I. K. Proudler, "CDMA signal detection using a prewhitening technique with the MUSIC algorithm", *Restricted, QQ Working Paper*, 48 pages, Jun. 2002
- I. Clarke, **S. Redif**, "Adaptive cancellation techniques for 'self-screening' jammers", *Restricted, QinetiQ/SIP Working Paper*, 16 pages, Jun. 2002

SATCOMS – MoD ARP project 1998–2000

JOURNAL PUBLICATIONS (SCI)

1. M. Carcenac and **S. Redif** "Application of the sequential matrix diagonalization algorithm to high-dimensional functional MRI data", *Computational Statistics*, Early Access, Oct. 2019. https://doi.org/10.1007/s00180-019-00925-8.

2. S. Kasap and **S. Redif**, "High performance system-on-chip based accelerator system for polynomial matrix multiplications", *Circuits, Systems and Signal Processing*, vol. 38, no. 12, pp. 5755-5785, May 2019. https://doi.org/10.1007/s00034-019-01150-w.

3. D. Hassan, **S. Redif** and S. Lambotharan, "Polynomial matrix decompositions and semi-blind channel estimation for MIMO frequency selective channels", *IET Signal Processing*, vol. 13, no. 3, pp. 356-366, May 2019. doi:10.1049/iet-spr.2018.5401.

4. F. Yorgancioglu and **S. Redif**, "Fast non-singular terminal decoupled sliding-mode control utilising time-varying sliding surfaces", *Turkish Journal of Electrical Engineering and Computer Sciences*, vol. 27, no. 3, pp. 1922-1937, May 2019. doi:10.3906/elk-1805-75.

5. S. Biricik, S. K. Khadem, **S. Redif** and M. Basu, "Voltage distortion mitigation in a distributed generation-integrated weak utility network via a self-tuning filter-based dynamic voltage restorer", *Electrical Engineering*, vol. 100, no. 3, pp.1857–1867, Sep. 2018. DOI 10.1007/s00202-017-0666-4.

6. M. Carcenac, **S. Redif** and S. Kasap, "GPU parallelization of the sequential matrix diagonalization algorithm and its application to high-dimensional data", *The Journal of Supercomputing*, vol. 73, no. 8, Jan. 2017.

7. S. Redif "Convolutive blind signal separation via polynomial matrix generalized eigenvalue decomposition", *IET Electronics Letters*, vol. 53, no. 2, pp. 87–89, 2017.

8. **S. Redif**, S. Weiss, and J. G. McWhirter, "Relevance of polynomial matrix decompositions to broadband blind signal separation," *Signal Processing*, vol. 134, pp. 76–86, 2017.

9. M. Carcenac and **S. Redif**, "A highly scalable modular bottleneck neural network for image dimensionality reduction and image transformation," *Applied Intelligence*, vol. 44, no. 3, pp. 557–610, April. 2016.

10. S. Biricik, O. Ozerdem, **S. Redif**, and S. Dinçer, "New hybrid active power filter for harmonic current suppression and reactive power compensation," *Int. Journal of Electronics*, vol. 103, no. 8, pp. 1397–1414, Feb. 2016.

11. S. Redif, "Fetal electrocardiogram estimation using polynomial eigenvalue decomposition", *Turkish Journal of Electrical Engineering and Computer Sciences*, vol. 24, no. 4, pp. 2483–2497, 2016.

12. S. Biricik, **S. Redif**, S. Khadem and M. Basu, "Improved harmonic suppression efficiency of single-phase APFs in distorted distribution systems," *International Journal of Electronics*, vol. 103, no. 2, pp. 232–246, May 2015.

13. S. Biricik, **S. Redif** and M. Basu, "Voltage sensor-less control of single-phase active power filter based on the SOGI algorithm," *Electric Power Components and Systems*, vol. 43, no. 7, pp. 820–827, Apr. 2015.

14. **S. Redif** and S. Kasap, "Novel reconfigurable hardware architecture for polynomial matrix multiplications", *IEEE Transactions on Very Large Scale Integration (VLSI) Systems*, vol. 23, no. 3, pp. 454–465, Mar. 2015.

15. **S. Redif**, S. Weiss and J. G. McWhirter, "Sequential matrix diagonalisation algorithms for polynomial EVD of parahermitian matrices," *IEEE Transactions on Signal Processing (TSP)*, vol. 63, no. 1, pp. 81–89, Jan. 2015.

16. S. Biricik, **S. Redif**, O. Ozerdem, S. Khadem and M. Basu, "Real-time control of shunt active power filter under distorted grid voltage and unbalanced load condition using self-tuning filter", *IET Power Electronics*, vol. 7, no. 7, pp. 1895–1905, Jul. 2014.

17. S. Kasap and **S. Redif**, "Novel field-programmable gate array architecture for computing the eigenvalue decomposition of para-hermitian polynomial matrices", *IEEE Transactions on Very Large Scale Integration (VLSI) Systems*, vol. 22, no. 3, pp. 522–536, Mar. 2014.

18. **S. Redif** and S. Kasap, "Parallel algorithm for computation of second-order sequential best rotations", *International Journal of Electronics*, vol. 100, no. 12, pp. 1646-1651, 2013. ISSN: 0020–7217

19. S. Biricik, O. Ozerdem, **S. Redif** and M. Khamil, "Performance improvement of active power filter under distorted and unbalanced grid voltage conditions", *Elektronika Ir Elektrotechnika*, vol. 19, no. 1, pp. 35–39, 2013. ISSN: 1392-1215.

20. **S. Redif**, J. G. McWhirter and S. Weiss, "Design of FIR paraunitary filter banks for subband coding using a polynomial eigenvalue decomposition," *IEEE Transactions on Signal Processing*, vol.59, No.11, pp. 5253–5264, Nov. 2011.

21. J. G. McWhirter, P. D. Baxter, T. Cooper, **S. Redif** and J. Foster, "An EVD algorithm for para-hermitian polynomial matrices", *IEEE Transactions on Signal Processing*, vol. 55, no. 5, pp. 2158–2169, May 2007.

22. S. Weiss, **S. Redif**, T. Cooper, C. Liu, P. D. Baxter and J. G. McWhirter, "Paraunitary oversampled filter bank design for channel coding," *EURASIP Journal of Applied Signal Processing*, vol. 2006, ID 31346, 2006.

International Conference Proceedings

23. **S. Redif**, J. Pestana and I. K. Proudler, "Analysis of broadband GEVD-based source separation", *IEEE Int. Conf. Acoustics, Speech Signal Process. (ICASSP-2019)*, Brighton, UK, pp. 8028-8032, May. 2019

24. S. Biricik and **S. Redif**, "Detection of grid voltage anomalies via broadband subspace decomposition", *IEEE Int. Conf. Acoustics, Speech Signal Process. (ICASSP-2019)*, Brighton, UK, pp. 8048-8052, May. 2019

25. D. Hassan, **S. Redif**, S. Lambotharan and I. K. Proudler, "Sequential polynomial QR decomposition and decoding of frequency selective MIMO channels", *European Signal Process. Conf. (EUSIPCO-2018)*, Rome, Italy, pp. 460-464, Sep. 2018

26. J. Corr, J. Pestana, S. Weiss, **S. Redif** and M. Moonen, "Investigation of a polynomial matrix generalised EVD for multi-channel Wiener filtering", *Asilomar Conf. Signals, Systems and Computers*, CA, USA, pp. 1354-1358, Nov. 2016

27. D. Hassan, Y. Kirsal and **S. Redif**, "Channel Capacity Improvement for cooperative MIMO wireless sensor networks via adaptive MIMO-SVD", *IEEE Int. Sympos. HONET-ICT*, CA, USA, pp. 49-53, Oct. 2016

28. S. Kasap and **S. Redif**, "Novel reconfigurable hardware implementation of polynomial matrix/vector multiplications", *IEEE Int. Conf. Field-Program. Tech. (ICFPT-2014)*, Shanghai, China, Dec. 2014.

29. S. Biricik, A. Salman, **S. Redif**, M. Basu, "Distributed control for the parallel DC linked modular shunt active power filters under distorted utility voltage condition", *IEEE Conf. Industrial Electronics Society (IECON-2014)*, Oct. 2014

30. J. Corr, K. Thomson, S. Weiss, J. G. McWhirter, **S. Redif**, I. K. Proudler, "Multiple shift maximum element sequential matrix diagonalisation for parahermitian matrices", *IEEE Workshop Statistical Signal Process. (SSP-2014)*, Gold Coast, Australia, Jul. 2014.

31. S. Biricik, S. K. Khadem, **S. Redif**, M. Basu, "Control of the dynamic voltage restorer to improve voltage quality", *IEEE Int. Symposium Power Electronics Distributed Generation Systems (PEDG 2014)*, Galway, Ireland, June 2014.

32. S. Biricik, **S. Redif**, S. K. Khadem, M. Basu, "Control of the single phase parallel active filter under weak grid voltages", *IEEE Int. Symposium Power Electronics Distributed Generation Systems (PEDG 2014)*, Galway, Ireland, June 2014.

33. M. A. Alrmah, S. Weiss, **S. Redif**, S. Lambotharan and J. G. McWhirter, "Angle of arrival estimation for broadband signals: A comparison", *Intelligent Signal Processing Conference (ISP 2013)*, IET, London, UK, Dec. 2013.

34. S. Biricik, **S. Redif**, O. C. Ozerdem, M. Basu, "Control of the shunt active power filter under non-ideal grid voltage and unbalanced load conditions", *Int. Universities Power Eng. Conf. (UPEC 2013)*, Dublin, Ireland, Sep. 2013.

35. S. Kasap and **S. Redif**, "FPGA implementation of a second-order convolutive blind signal separation algorithm", *IEEE Signal Process. & Communication Application Conf. (SIU-2014)*, Turkey, Apr. 2013.

36. S. Kasap and **S. Redif**, "FPGA-based design and implementation of an approximate polynomial matrix EVD algorithm", *IEEE Int. Conf. Field-Program. Technology (ICFPT-2012)*, Seoul, Korea, Dec. 2012.

37. S. Biricik, O. C. Ozerdem, **S. Redif**, M. O. I. Kmail, "Novel hybrid active power filter structure to compensate harmonic currents and reactive power", *IEEE Mediterranean Electrotechnical Conf. (MELECON-2012)*, Tunisia, Mar. 2012.

38. **S. Redif**, J. G. McWhirter, S. Weiss "An approximate polynomial matrix eigenvalue decomposition algorithm for para-Hermitian matrices", *IEEE Int. Sympos. Signal Process. Inform. Techn., (ISSPIT-2011)*, pp. 421–425, Bilbao, Spain, 2011.

39. S. Biricik, O. C. Ozerdem, **S. Redif**, M. O. I. Kmail, "Performance improvement of active power filters based on p-q and d-q control methods under non-ideal supply voltage conditions", *IEEE Int. Conf. EEE (ELECO-2011)*, Turkey, Dec 2011.

40. **S. Redif**, J. G. McWhirter, S. Weiss, "Orthonormal subband coder design using polynomial eigenvalue decomposition", *EURASIP European Signal Process. Conf. (EUSIPCO-2010)*, Aalborg, Denmark, Aug. 2010. Top Paper in EUSIPCO-2010.

41. **S. Redif**, U. Fahrioglu, "Foetal ECG extraction using broadband signal subspace decomposition", *IEEE Mediterranean Microwave Symposium (MMS-2010)*, Cyprus, Aug. 2010.

42. C. L. Koh, **S. Redif** and S. Weiss, "Broadband GSC beamformer with spatial and temporal decorrelation", *EURASIP European Signal Process. Conf. (EUSIPCO-2009)*, Glasgow, Scotland, Aug. 2009.

43. **S. Redif**, J. G. McWhirter, P. Baxter and T. Cooper "Robust broadband adaptive beamforming via polynomial matrix eigenvalue decomposition", *IMA Int. Conf. Mathematics in Communications*, Cirencester, U.K., Dec. 2006.

44. **S. Redif**, J. G. McWhirter, P. Baxter and T. Cooper "Robust Broadband Adaptive Beamforming via Polynomial Eigenvalues", *IEEE/MTS OCEANS Conf. (OCEANS-2006)*, Boston, MA, USA, pp. 1–6, Sep. 2006.

45. J. G. McWhirter, P. Baxter and T. Cooper, **S. Redif**, "A novel technique for broadband subspace decomposition", *EURASIP European Signal Process. Conf. (EUSIPCO-2006)*, Florence, Italy, Sep. 2006.

46. C. Liu, S. Weiss, **S. Redif**, T. Cooper, L. Lampe, J. G. McWhirter, "Channel coding for power line communication based on oversampled filter banks", *IEEE Int. Sympos. Power-Line Communications and its Applications (ISPLC-2005)*, Vancouver, CA, pp. 246–249, Apr. 2005.

47. **S. Redif** and T. Cooper, "Paraunitary filter bank design via a polynomial singular value decomposition", *IEEE Int. Conf. Acoustics, Speech Signal Process. (ICASSP-2005)*, Philadelphia, PA, volume 4, pp. 613–616, Mar. 2005.

48. **S. Redif** and T. Cooper, "Orthonormal filter bank design using a space-time singular-value decomposition", *IMA Int. Conf. Mathematics in Signal Process.*, Royal Agricultural College, Cirencester, UK, Dec. 2004.

49. **S. Redif** and I. K. Proudler, "A novel algorithm for single channel signal separation of communications signals", *IMA Int. Conf. on Mathematics in Communications*, Royal Agricultural Lancaster University, Dec. 2002.

References

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University of Leicester, Leicester, LE1 7RH, U.K.
email: jonathon.chambers@ncl.ac.uk Tel.: +44 (0)116 252 2559