Catalin Grigoras, Ph.D.

Associate Professor
National Center for Media Forensics
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EDUCATION

Institution	Date	Degree	Major
Cambridge University, UK	2003	Post-Doctoral	Forensic Sciences
University Politehnica Bucharest, RO	2001	Ph.D.	Digital Signal Processing
University Politehnica Bucharest, RO	1994	M.Sc.	Electric Engineering

PROFESSIONAL EXPERIENCE

2017-present	Associate Professor with the University of Colorado Denver, Director of the National Center for Media Forensics
2010-2017	Assistant Professor with the University of Colorado Denver, Director of the National Center for Media Forensics
2002-2010	Forensic Expert with the Ministry of Justice, Romania
2007-2009	Chairman of European Network of Forensic Science Institutes – Forensic Speech and Audio Analysis Working Group (ENFSI-FSAAWG)
2005-2010	Assistant Professor with the National Institute for Magistracy, Romania
2002-2009	Member of the European Network of Forensic Science Institutes – Forensic Speech and Audio Analysis Working Group (ENFSI-FSAAWG)
1994-2002	Forensic Audio and Video Specialist, Romanian Intelligence & Internal Affairs

PUBLICATIONS

Grigoras C., Smith J.M. (2019) Forensic Analysis of AAC Encoding on Apple iPhone Voice Memos Recordings, 2019 AES International Conference on Audio Forensics, Porto, Portugal

Grigoras C., Smith J., Zjalic J. (2018) An Audio Enhancement Framework for Forensic Purposes, American Academy of Forensic Sciences, 70th Annual Scientific Meeting, Seattle, WA, USA

Grigoras C., Smith J. (2018) Time Domain Analysis of Lossy Compression Decoding Artifacts, American Academy of Forensic Sciences, 70th Annual Scientific Meeting, Seattle, WA, USA

Lomboy G., Grigoras C., Smith J. (2018) Digital Image Recompression Analysis: Twitter, American Academy of Forensic Sciences, 70th Annual Scientific Meeting, Seattle, WA, USA

Grigoras C., Smith J.M. (2017) Large Scale Test of Digital Audio File Structure and Format for Forensic Analysis, 2017 AES International Conference on Audio Forensics, Arlington VA, USA

Zjalic, J., Grigoras C., Smith J.M. (2017) A Low Cost, Cloud Based, Portable, Remote ENF System, 2017 AES International Conference on Audio Forensics, Arlington VA, USA

Smith, J., Lacey, D., Koenig, B., Grigoras, C. (2017) Triage Approach for the Forensic Analysis of Apple iOS Audio Files Recorded Using the "Voice Memos" App, 2017 AES International Conference on Audio Forensics, Arlington VA, USA

Grigoras C., Smith J.M. (2017) Structure and Format Analysis of Lossy Compressed Audio Files, American Academy of Forensic Sciences, 69th Annual Scientific Meeting, New Orleans, LA, USA

Smith J.M., Lacey D.S., Grigoras C., Koenig B.E. (2017) An Analysis of Apple iOS Effects on Format and Metadata Structure of Audio Files Recorded Using the Native "Voice Memos" App, American Academy of Forensic Sciences, 69th Annual Scientific Meeting, New Orleans, LA, USA

Grigoras C., Smith J.M., Drygajlo A. (2016) Forensic Audio Analysis Review 2013-2016, Interpol 18th International Forensic Science Managers Symposium, Lyon, France

Grigoras C., Smith J.M. (2016) Forensic Analysis of Digital Audio File Structures and Formats, American Academy of Forensic Sciences, 68th Annual Scientific Meeting, Las Vegas, NV, USA

Bonilla E., Grigoras C., Smith J.M. (2016) Proposed Analytical Framework for Electronically Frequency/Pitch Modified Voices, American Academy of Forensic Sciences, 68th Annual Scientific Meeting, Las Vegas, NV, USA

Giammarrusco Z.P., Grigoras C., Smith J.M. (2016) Source Identification of High-Definition Videos – A Forensic Analysis of Downloaders and YouTube Video Compression Using a Group of Action Cameras, American Academy of Forensic Sciences, 68th Annual Scientific Meeting, Las Vegas, NV, USA

Grigoras C., Smith J.M. (2014) Quantization Level Analysis for Forensic Media Authentication, AES 54th International Conference, London, UK

Grigoras C., Smith J.M., Morisson G. (2013) *Forensic Audio Analysis Review 2010-2013*, Interpol 17th International Forensic Science Managers Symposium, Lyon, France

Grigoras C., and Smith J.M. (2013) Digital Imaging: Enhancement and Authentication. In: Siegel JA and Saukko PJ (eds.) Encyclopedia of Forensic Sciences, Second Edition, pp. 303-314. Waltham: Academic Press. [*selected by Computing Reviews as a notable computing article of 2013*]

Grigoras C., and Smith J.M. (2013) Audio Enhancement and Authentication. In: Siegel JA and Saukko PJ (eds.) Encyclopedia of Forensic Sciences, Second Edition, pp. 315-326. Waltham: Academic Press.

Koenig, B.E., Lacey, D., Grigoras, C., Price, S., Smith, J. (2013) *Evaluation of the Average DC Offset Values for Nine Small Digital Audio Recorders*, JAES Volume 61 Issue 6 pp. 439-448; June 2013

Grigoras, C., Rappaport, D., Smith, J., (2012) *Analytical Framework for Digital Audio Authentication*, AES 46th International Conference: Audio Forensics, Denver, USA

Grigoras, C., Smith, J., (2012) *Advances in ENF Analysis for Digital Media Authentication*, AES 46th International Conference: Audio Forensics, Denver, USA

Koenig, B.E., Lacey, D., Grigoras, C., Price, S., Smith, J. (2012) *Evaluation of the Average DC Offset Values for Nine Small Digital Audio Recorders*, AES 46th International Conference: Audio Forensics, Denver, USA

Grigoras, C., Smith, J., Jenkins, C. (2011) *Advances in ENF Database Configuration for Forensic Authentication of Digital Media*, AES Convention, New York, USA

Grigoras, C. (2010) *Statistical Tools for Multimedia Forensics: Compression Effects Analysis*, AES 39th International Conference Audio Forensics, Hillerod, Denmark

Grigoras, C. (2009) *Applications of ENF Analysis in Forensic Authentication of Digital Audio and Video Recordings*, J. Audio Eng. Soc., Vol. 57, No. 9, September 2009

Grigoras, C., Cooper, A., Michalek, M. (2009) *Forensic Speech and Audio Analysis Working Group – Best Practice Guidelines for ENF Analysis in Forensic Authentication of Digital Evidence*, ENFSI-FSAAWG

Becker, T., Jessen, M., Grigoras, C. (2009) *Speaker Verification Based on Formants Using Gaussian Mixture Models*, NAG/DAGA International Conference on Acoustics, 2009, Rotterdam, Netherlands

Becker, T., Jessen, M., Grigoras, C. (2008) *Forensic Speaker Verification Using Formant Features and Gaussian Mixture Models*, Interspeech 2008 Special Session: Forensic Speaker Recognition – Traditional and Automatic Approaches, Brisbane, Queensland, Australia, September 2008

Grigoras, C. (2008) *Applications of ENF Analysis Method in Forensic Authentication of Digital Audio and Video Recordings*, Audio Engineering Society Convention, New York, USA

Grigoras, C. (2007) *Applications of ENF criterion in forensic audio, video, computer and communication analysis*, Forensic Science International Volume 167 Issues 2-3, Elsevier Publishing House

Grigoras, C., Nolan, F. (2005) *A case for formant analysis in forensic speaker identification*, The International Journal of Speech Language and the Law, Vol.12 No.2, pp.143-173

Grigoras, C. (2005) *Digital audio recording analysis: The Electric Network Frequency (ENF) Criterion*, The International Journal of Speech Language and the Law, Vol.12 No.1, pp.63-76

Grigoras, C. (2003) *Forensic Analysis of Digital Audio Recordings – The Electric Network Frequency Criterion*, Forensic Science International, 136, Supp. [1], pp. 368-369

Grigoras, C. (2002) *Forensic Audio Noise Reduction*, 16th Meeting of the International Association of Forensic Sciences, IAFS 2002, Montpellier, France

PRESENTATIONS

Grigoras C., Smith J.M. (2017) *Structure and Format Analysis of Lossy Compressed Audio Files*, American Academy of Forensic Sciences, 69th Annual Scientific Meeting, New Orleans, LA, USA

Interpol 18th International Forensic Science Managers Symposium, Lyon, France, *Forensic Audio Analysis Review 2013-2016*, 2016

Grigoras C., Smith J.M. (2016) *Forensic Analysis of Digital Audio File Structures and Formats*, American Academy of Forensic Sciences, 68th Annual Scientific Meeting, Las Vegas, NV, USA

Bonilla E., Grigoras C., Smith J.M. (2016) *Proposed Analytical Framework for Electronically Frequency/Pitch Modified Voices*, American Academy of Forensic Sciences, 68th Annual Scientific Meeting, Las Vegas, NV, USA

Grigoras C., Smith J.M. (2014) *Quantization Level Analysis for Forensic Media Authentication*, AES 54th International Conference, London, UK

Grigoras C., Smith J.M., Morisson G. (2013) *Forensic Audio Analysis Review 2010-2013*, Interpol 17th International Forensic Science Managers Symposium, Lyon, France

Anderson, S., Grigoras, C., Smith, J. (2013) Establishing Criteria for the Authentication of Digital Imagery, American Academy of Forensic Sciences, Washington, D.C., USA

Smith, J., Grigoras, C., (2013) A Case Study in 3GP File Analysis and Repair, American Academy of Forensic Sciences, Washington, D.C., USA

Grigoras, C., Rappaport, D., Smith, J. (2013) Framework for Authenticity Analysis of Digital Audio, American Academy of Forensic Sciences, Washington, D.C., USA

Grigoras, C., Smith, J. (2013) Electric Network Frequency (ENF) Database Validation for Digital Media Authenticity, American Academy of Forensic Sciences, Washington, D.C., USA

Grigoras, C., Rappaport, D., Smith, J., (2012) *Analytical Framework for Digital Audio Authentication*, AES 46th International Conference: Audio Forensics, Denver, USA.

Grigoras, C., Smith, J., (2012) *Advances in ENF Analysis for Digital Media Authentication*, AES 46th International Conference: Audio Forensics, Denver, USA.

Koenig, B. et al, (2012) *Evaluation of the Average DC Offset Values for Nine Small Digital Audio Recorders*, AES 46th International Conference: Audio Forensics, Denver, USA.

Grigoras, C., Smith, J., Jenkins, C. (2011) *Advances in ENF Database Configuration for Forensic Authentication of Digital Media*, AES Convention, New York, USA.

Grigoras, C. (2010) *Statistical Tools for Multimedia Forensics: Compression Effects Analysis*, AES 39th International Conference Audio Forensics, Hillerod, Denmark.

Grigoras, C. (2009) *Forensic Speaker Recognition*, European Academy of Forensic Sciences Conference, Glasgow, UK

Grigoras, C. (2007) ENF Applications in Forensic Audio Authentication, Audio Engineering Society Conference, NY, USA

Grigoras, C. (2007) Applications of ENF Methodology in Forensic Audio Authentication, Audio Engineering Society Convention, Vienna, Austria

Grigoras, C., Moreno, A. (2007) Automatic Speaker Recognition Methodology using BATVOX, Symposium of Forensic Sciences, Cluj-Napoca, Romania

Del Monte, F., Bouten, J., Grigoras, C., Gonzalez-Rodriguez, J. (2006) Dating of Digital Audio Recordings by Matching of Electrical Network Frequency Patterns, EAFS, Helsinki, Finland

Grigoras, C. (2006) Applications of ENF Criterion in Forensic Audio, Video, Computer and Telecommunication Analysis, Audio Engineering Society Convention, Paris, France

Grigoras, C. (2006) *Applications of ENF criterion in forensic audio, video, computer and communication analysis*, European Academy of Forensic Sciences Conference, Helsinki, Finland

Nolan, F., Grigoras, C. (2004) Formant analysis in forensic speaker identification: a justification and a new method, IAFPA 2004 Helsinki, Finland

INVITED SPEAKER

Interpol 18th International Forensic Science Managers Symposium, Lyon, France, *Forensic Audio Analysis Review 2013-2016*, 2016

Association of Research Integrity Officers (ARIO), 3rd Annual Meeting, Denver, CO, Sep 28-30, 2015

Digital Forensic Research Workshop (DFRWS), Denver, CO, Aug 4, 2014

Interpol 17th International Forensic Science Managers Symposium, Lyon, France, *Forensic Audio Analysis Review 2010-2013*, 2013

Digital Summit International (DSI), Las Vegas, NV, 2012, Aug 15, http://www.dsivegas.com/Workshops.aspx

Law Enforcement & Emergency Services Video Association (LEVA), San Diego, Oct 24, 2012 Digital Image Authentication Workshop

Audio Engineering Society (AES), San Francisco, Oct 26, 2012 W1 - Forensic Authentication of Digital Audio

COURSES TAUGHT

– Foundations in Media Forensics
– MATLAB Foundations
– Forensic Audio Analysis
– MATLAB for Forensic Audio Analysis
– Forensic Video and Image Analysis
– MATLAB for Forensic Video and Image Analysis
– Forensic Authentication of Digital Audio
– Forensic Authentication of Digital Images

MEDIA

2019 Feb 13, Seeing isn't believing (podcast)

2018 Feb 18, The Darthmouth, [Professors weigh in on video manipulation](#)
2016 Aug 11, Westword "[I did it: How CU Denver Media Forensics Unmasked a Murderer](#)"
2015/2016 Japanese National Television (NHK), Documentary "70 Years After", Forensic analysis of Japanese Prisoners of War (POW) historical recordings
2014 Sep 3rd, KRDO TV, [Media Forensics Experts](#)
2013 Feb 8th, [CBS4 - Digital Media Help Detectives Solve Crimes](#)
2012 BBC, by Rebecca Morelle, [The hum that helps to fight crime](#)
2011 Cabinet, by Lawrence A. H., [The Freedom of Speech Itself](#)
2010 The Register, by Christopher Williams, [Power lines act as police informers](#)
2008 The Security Newsletter, [Forensic authentication of audio recordings](#)
2007 Wired Magazine, [Audio Forensic Experts Reveal (Some) Secrets](#)

SOFTWARE DEVELOPMENT

Catalina – Forensic Voice Analysis System (IAFPA Grant)
FAAS – Forensic Audio Analysis System
FIAS – Forensic Image Analysis System
ARGO – Forensic Video Analysis and Authentication System

FORENSIC AUDIO & VIDEO TRAINING PROVIDED TO:

Australia, Brazil, Canada, Cyprus, Denmark, Estonia, France, Germany, Greece, Israel, Italy, Kuwait, Malaysia, Morocco, Netherlands, Saudi Arabia, Singapore, Sweden, Turkey, United Arab Emirates, USA, etc.

MEMBER OF EDITORIAL BOARDS / PEER-REVIEWER

National Science Foundation (NSF)
Forensic Science International (FSI)
Journal of Forensic Sciences (JFS)
Audio Engineering Society (JAES)
The International Journal of Speech, Language and the Law (IJSLL)

PROFESSIONAL AFFILIATION

American Academy of Forensic Sciences (AAFS)
Audio Engineering Society (AES)
European Network of Forensic Science Institutes, Forensic Speech and Audio Analysis Working Group (ENFSI, FSAAWG)
International Association for Forensic Phonetics and Acoustics (IAFPA)
Scientific Working Group on Digital Evidence (SWGDE), Member of the Audio Committee, Chair

FORENSIC AUDIO/VIDEO EXPERTISE

USA: 2016 / Forensic Video Report and Testimony
                The People of the State of Colorado v. Josh Waggener
                20th Judicial District / Boulder County

                2012 / Forensic Video Report and Testimony
                The People of the State of Colorado vs. Brendan Warrior
                Arapahoe County District/County Courts

2011 / Forensic Audio Report and Testimony
The People of the State of Colorado vs. Joshua Rashaad Golston
Arapahoe County District/County Courts

Cyprus: 2012 / Forensic Video Report and Testimony
Court of Assize – Nicosia, CYPRUS
Criminal Case no. 19325/2010

plus cases for Amnesty International, Bulgaria, Georgia, Germany, India, Kazakhstan, Moldavia, Romania, Ukraine, etc.

RELEVANT TRAININGS
2019   Cognitive and Human Factors in Forensic Decision Making Workshop, Prof. Itiel Dror, CU Denver
2018   DME Forensics & iNPUT-ACE Video Investigation, Golden, CO, USA
2013   Resolution Video - Digital Video Processing, Thornton, Colorado, USA
2012   Forensic 3D Videogrammetry, Digital Summit International, Las Vegas, USA
2012   Forensic Video Training, Cognitech, Pasadena, CA, USA
2008   Forensic Image Analysis, European Commission, Vilnius, Lithuania
2008   Automatic Speaker Recognition, Agnitio, Madrid, Spain
2002   Forensic Audio, Speech Technology Center, Saarbrucken, Germany
2000   Forensic Audio/Video, New York Institute for Forensic Audio, NY, USA