

Tammam TILLO – Résumé

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Personal Profile Summary

Tammam TILLO received the Engineer Diploma in electrical engineering from the University of Damascus, Syria, in 1994, and the Ph.D. degree in electronics and communication engineering from Politecnico di Torino, Italy, in 2005. In 2004, he served as a visiting research student at Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland. From 2005 to 2008, he worked as a Postdoctoral Researcher at the Image Processing Lab (IPL) of Politecnico di Torino. For few months he was Invited Research Professor at the Digital Media Lab, SungKyunKwan University, Republic of Korea. In 2008 he joined Xi'an Jiaotong-Liverpool University (XJTTLU), China, where he established the multimedia technology lab (MMTlab). From 2010 to 2013 he was the Head of the Department of Electrical and Electronic Engineering at XJTTLU University, and was the Acting Head of the Department of Computer Science and Software Engineering from 2012 to 2013. He joined Free University of Bozen-Bolzano (unibz), Italy, in 2017.

Research Interests

- Image and video coding
- Error resilient transmission of multimedia data
- 3D video coding and analysis
- Depth map applications
- Multiple description coding
- Video concealment
- Hyperspectral image compression
- Deep learning for the aforementioned topics

Teaching Interests

- Signal processing
- Image and video processing
- Compression of multimedia data
- Fundamentals of Electronic circuits

Languages

- Arabic** mother tongue
- Italian** mother tongue
- English** fluent
- French** elementary knowledge
- Chinese** elementary knowledge

Education

- 2002-2005** Doctor of Philosophy - Politecnico di Torino, Turin, Italy
Ph.D. in Electronic and telecommunication Engineering
- 1989-1994** Engineer Diploma - University of Damascus, Damascus, Syria
Engineer Diploma in Electronic Engineering

Academic Experiences

- May 2017** Free University of Bozen-Bolzano, Italy
Present *Associate Professor in the Faculty of Computer Science*
- Aug 2008** Xi'an Jiaotong-Liverpool University, Suzhou, China
Aug 2012 *Associate Professor in the Electrical and Electronic Engineering Department*
Sep 2012 Xi'an Jiaotong-Liverpool University, Suzhou, China
Apr 2017 *Full Professor in the Electrical and Electronic Engineering Department*
- Jul 2009 -** Politecnico di Torino, Turin, Italy
Aug 2009 *Invited researcher*
- Jan 2008 -** Sungkyunkwan University, Suwon, S.Koreaa
Mar 2008 *Invited research professor*
- Jan 2005 -** Politecnico di Torino, Turin, Italy
Aug 2008 *Post Doctorate Researcher*
- Jul 2004 -** Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland
Jan 2005 *Visiting research student*
- Sep 1998 -** University of Damascus, Damascus, Syria
Jun 2000 *Part time laboratory assistant*

Academic Teaching Experience

My teaching experience started in 1998 at University of Damascus, Syria. For further details please refer to the extended version of the CV.

Funded Research Projects

- Jan 2013 -** Major/Key NSFC (National Science Foundation of China) - fund 2.7 million RMB
Dec 2017 *Co-Principle investigator (my team's budget is 1.35 million RMB)*
- *Title: Object and MacroCube-based Coding and Understanding 3D Video.*
- Jan 2010 -** General NSFC (National Science Foundation of China) - fund 405 000 RMB
Dec 2012 *Principle investigator*

- *Title: Error-resilient video streaming over heterogeneous P2P overlay network (No. 60972085).*

Jan 2010 - General NSFC (National Science Foundation of China)

Dec 2012 *Second investigator*

- *Title: Research on Correlation Optimisation Criterion Based Multiple Description Video Coding over Heterogeneous Network (No. 60903066).*

May 2010 - Natural Science Foundation of Jiangsu Province (provincial-level fund) - fund 150 000 RMB

Apr 2012 *Principle investigator*

- *Title: high resolution image acquisition with wireless capsule endoscopy and video endoscopy (No. BK2010251).*

Jul 2010 - Suzhou Science program (municipal-level fund) - fund 150 000 RMB

Jun 2012 *Principle investigator*

- *Title: Innovative image processing technique to reduce diagnosis time of the video and wireless capsules endoscopy images (No.SYG201011).*

Dec 2016 - Ph.D. Scholarship (university-level fund) - 366 000 RMB > fund > 126 000 RMB

Principle investigator

- *Title: Scalable compression of Light Field images and video (No. RDF-16-01-66).*

Dec 2016 - Ph.D. Scholarship (university-level fund) - 366 000 RMB > fund > 126 000 RMB

terminated *Principle investigator*

- *Title: Sensor Assisted Video Coding (No. RDF-16-01-67).*

Apr 2012 - Research Development Fund (university-level fund) - fund 25 000 RMB

Dec 2013 *Principle investigator*

- *Title: controllable geometry distortion to enhance 3D video compression (No. RDF-11-01-11).*

Research Project Member

Jan 2008 - VII European Framework Programme

Aug 2008 *Research member*

- *Title: seamless content delivery.*

Jan 2004 - VII European Framework Programme

Dec 2007 *Research member*

- *Title: Network of Excellence in Wireless Communications (NEWCOM).*

Apr 2002 - Research center at Politecnico di Torino (university-level fund)

Dec 2004 *Research member*

- *Title: Center for Multimedia Radio Communications (CERCOM).*

Jan 2008 - “Ricerca Sanitaria Finalizzata” (provincial-level fund)

Aug 2008 *Research member*

- *Title: automatic identification of pathologies in the wireless capsule endoscopy images.*

Jan 2007 - “Ricerca Scientifica Applicata” (provincial-level fund)

Dec 2007 *Research member*

- *Title: advanced techniques for on board compression of remote sensing image.*

Ph.D. Supervisor

Yu Principle Supervisor, from 2012 to 2017

LI *Thesis title: Statistic oriented Video Coding and Streaming Methods with Future Insight.*

Zhi Principle Supervisor, from 2012 to 2016

JIN *Thesis title: Depth-Map-Assisted Texture and Depth Map Super-Resolution.*

Jimin Principle Supervisor, from 2009 to 2013

XIAO *Thesis title: Video Streaming over P2P Overlay Network.*

Boyuan Principle Supervisor, from May 2013 to present

SUN

Fei Principle Supervisor, from June 2014 to present

CHENG

Samer Principle Supervisor, from 2015

JAMMAL

Yanchun Co-supervisor (20%), from 2016

XIE

Dingyuan Co-supervisor (20%), from 2017

ZHENG

Raja Shahmir Co-supervisor (20%), from 2015

NIZAM

Articles in Journals

- [1] F. Cheng, T. Tillo, J. Xiao, and B. Jeon, “Texture plus depth video coding using camera global motion information,” *IEEE Transactions on Multimedia*, vol. PP, no. 99, pp. 1–1, 2017.
- [2] L. Yu, T. Tillo, and J. Xiao, “Qoe-driven dynamic adaptive video streaming strategy with future information,” *IEEE Transactions on Broadcasting*, vol. PP, no. 99, pp. 1–12, 2017.
- [3] C. Yao, J. Xiao, T. Tillo, Y. Zhao, C. Lin, and H. Bai, “Depth map down-sampling and coding based on synthesized view distortion,” *IEEE Transactions on Multimedia*, vol. 18, pp. 2015–2022, Oct 2016.

- [4] Z. Jin, T. Tillo, C. Yao, J. Xiao, and Y. Zhao, "Virtual-view-assisted video super-resolution and enhancement," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 26, pp. 467–478, March 2016.
- [5] Z. Jin, T. Tillo, J. Xiao, and Y. Zhao, "Multiview video plus depth transmission via virtual-view-assisted complementary down/upsampling," *EURASIP J. Image and Video Processing*, vol. 2016, p. 19, 2016.
- [6] H. Lee, T. Tillo, and B. Jeon, "Hybrid wyner-ziv video coding with no feedback channel," *Transactions on Smart Processing and Computing*, vol. 5, no. 6, p. 418, 2016.
- [7] C. Lin, Y. Zhao, T. Tillo, and J. Xiao, "Multiple description coding for stereoscopic videos with stagger frame order," *Circuits and Systems for Video Technology, IEEE Transactions on*, vol. 25, pp. 1016–1025, June 2015.
- [8] J. Xiao, M. Hannuksela, T. Tillo, M. Gabbouj, C. Zhu, and Y. Zhao, "Scalable bit allocation between texture and depth views for 3-d video streaming over heterogeneous networks," *Circuits and Systems for Video Technology, IEEE Transactions on*, vol. 25, pp. 139–152, Jan 2015.
- [9] C. Lin, Y. Zhao, J. Xiao, and T. Tillo, "Depth map coding using histogram-based segmentation and depth range updating," *KSII Transactions on Internet and Information Systems, TIIIS*, vol. 9, no. 3, pp. 1121–1139, 2015.
- [10] C. Yao, T. Tillo, Y. Zhao, J. Xiao, H. Bai, and C. Lin, "Depth map driven hole filling algorithm exploiting temporal correlation information," *Broadcasting, IEEE Transactions on*, vol. 60, pp. 394–404, June 2014.
- [11] J. Xiao, T. Tillo, H. Yuan, and Y. Zhao, "Macroblock level bits allocation for depth maps in 3-d video coding," *Journal of Signal Processing Systems*, vol. 74, no. 1, pp. 127–135, 2014.
- [12] J. Xiao, T. Tillo, and Y. Zhao, "Real-time video streaming using randomized expanding reed-solomon code," *Circuits and Systems for Video Technology, IEEE Transactions on*, vol. 23, pp. 1825–1836, Nov 2013.
- [13] J. Xiao, T. Tillo, C. Lin, Y. Zhang, and Y. Zhao, "A real-time error resilient video streaming scheme exploiting the late- and early-arrival packets," *Broadcasting, IEEE Transactions on*, vol. 59, pp. 432–444, Sept 2013.
- [14] E. Baccaglini, G. Marchetto, T. Tillo, and G. Olmo, "Efficient slice-aware h.264/avc video transmission over time-driven priority networks," *International Journal of Communication Systems*, 2013.
- [15] J. Xiao, T. Tillo, C. Lin, and Y. Zhao, "Dynamic sub-gop forward error correction code for real-time video applications," *Multimedia, IEEE Transactions on*, vol. 14, pp. 1298–1308, Aug 2012.
- [16] C. Lin, T. Tillo, J. Xiao, and Y. Zhao, "Optimizing the deadzone width to improve the polyphase-based multiple description coding," *Multimedia Tools and Applications*, 2012.
- [17] T. Tillo, E. Baccaglini, and G. Olmo, "Unequal protection of video data according to slice relevance," *Image Processing, IEEE Transactions on*, vol. 20, pp. 1572–1582, June 2011.
- [18] C. Lin, T. Tillo, Y. Zhao, and B. Jeon, "Multiple description coding for h.264/avc with redundancy allocation at macro block level," *Circuits and Systems for Video Technology, IEEE Transactions on*, vol. 21, pp. 589–600, May 2011.
- [19] E. Baccaglini, T. Tillo, and G. Olmo, "Image and video transmission: a comparison study of using unequal loss protection and multiple description coding, multimedia tools and applications," *Special Issue: Mobile Media Delivery*, vol. 55, no. 2, pp. 247–259, 2011.
- [20] J. Xiao, T. Tillo, C. Lin, and Y. Zhao, "Joint redundant motion vector and intra macroblock refreshment for video transmission," *EURASIP Journal on Image and Video Processing*, 2011.
- [21] J. Xiao, T. Tillo, C. Lin, and Y. Zhao, "Error resilient video coding with end-to-end rate-distortion optimized at macroblock level," *EURASIP Journal on Advances in Signal Processing*, 2011.

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- [25] E. Baccaglioni, T. Tillo, and G. Olmo, "Slice sorting for unequal loss protection of video streams," *Signal Processing Letters, IEEE*, vol. 15, pp. 581–584, 2008.
- [26] T. Tillo and G. Olmo, "Improving the performance of multiple description coding based on scalar quantization," *Signal Processing Letters, IEEE*, vol. 15, pp. 329–332, 2008.
- [27] T. Tillo, M. Grangetto, and G. Olmo, "Redundant slice optimal allocation for h.264 multiple description coding," *Circuits and Systems for Video Technology, IEEE Transactions on*, vol. 18, pp. 59–70, Jan 2008.
- [28] T. Tillo, M. Grangetto, and G. Olmo, "On modeling mismatch errors induced by different quantizers," *Signal Processing Letters, IEEE*, vol. 14, pp. 785–788, Nov 2007.
- [29] B. Penna, T. Tillo, E. Magli, and G. Olmo, "Hyperspectral image compression employing a model of anomalous pixels," *Geoscience and Remote Sensing Letters, IEEE*, vol. 4, pp. 664–668, Oct 2007.
- [30] B. Penna, T. Tillo, E. Magli, and G. Olmo, "Transform coding techniques for lossy hyperspectral data compression," *Geoscience and Remote Sensing, IEEE Transactions on*, vol. 45, pp. 1408–1421, May 2007.
- [31] T. Tillo and G. Olmo, "Data-dependent pre- and postprocessing multiple description coding of images," *Image Processing, IEEE Transactions on*, vol. 16, pp. 1269–1280, May 2007.
- [32] E. Baccaglioni, T. Tillo, and G. Olmo, "A flexible r-d-based multiple description scheme for jpeg 2000," *Signal Processing Letters, IEEE*, vol. 14, pp. 197–200, March 2007.
- [33] T. Tillo, M. Grangetto, and G. Olmo, "Multiple description image coding based on lagrangian rate allocation," *Image Processing, IEEE Transactions on*, vol. 16, pp. 673–683, March 2007.
- [34] B. Penna, T. Tillo, E. Magli, and G. Olmo, "Progressive 3-d coding of hyperspectral images based on jpeg 2000," *Geoscience and Remote Sensing Letters, IEEE*, vol. 3, pp. 125–129, Jan 2006.
- [35] T. Tillo and G. Olmo, "A novel multiple description coding scheme compatible with the jpeg2000 decoder," *Signal Processing Letters, IEEE*, vol. 11, pp. 908–911, Nov 2004.

Articles in Conferences

- [1] Y. Xie, J. Xiao, T. Tillo, Y. Wei, and Y. Zhao, "3d video super-resolution using fully convolutional neural networks," in *2016 IEEE International Conference on Multimedia and Expo (ICME)*, pp. 1–6, July 2016.
- [2] X. Zhang, Y. Zhao, T. Tillo, C. Lin, J. Xiao, and A. Wang, "Packetization strategies for mvd-based 3d video transmission," in *2016 Visual Communications and Image Processing (VCIP)*, pp. 1–4, Nov 2016.
- [3] L. Yu, J. Xiao, T. Tillo, and C. Zhu, "Statistical approach for motion estimation skipping (samek)," in *Image Processing (ICIP), 2015 IEEE International Conference on*, pp. 3245–3249, Sept 2015.
- [4] F. Cheng, J. Xiao, and T. Tillo, "3d video coding using motion information and depth map," in *Multimedia and Expo (ICME), 2015 IEEE International Conference on*, pp. 1–6, June 2015.
- [5] Z. Jin, T. Tillo, and L. Luo, "Quality enhancement of quality-asymmetric multiview plus depth video by using virtual view," in *2015 IEEE International Conference on Multimedia Expo Workshops (ICMEW)*, pp. 1–6, June 2015.

- [6] B. Sun, T. Tillo, and M. Xu, "Adaptive model for background extraction using depth map," in *Pacific-Rim Conference on Multimedia, Gwangju, Korea*, 2015.
- [7] T. Tillo, Z. Jin, and F. Cheng, "Super-resolution of depth map exploiting planar surfaces," in *Pacific-Rim Conference on Multimedia, Gwangju, Korea*, 2015.
- [8] F. Cheng, J. Xiao, T. Tillo, and Y. Zhao, "A flexible programmable camera control and data acquisition hardware platform," in *Pacific-Rim Conference on Multimedia, Gwangju, Korea*, 2015.
- [9] F. Cheng, J. Xiao, T. Tillo, and Y. Zhao, "Global motion information based depth map sequence coding," in *Pacific-Rim Conference on Multimedia, Gwangju, Korea*, 2015.
- [10] H. LIN, C. LIN, Y. Zhao, J. Xiao, and T. Tillo, "Depth-based stereoscopic projection approach for 3d saliency detection," in *Pacific-Rim Conference on Multimedia, Gwangju, Korea*, 2015.
- [11] J. Xiao, M. Hannuksela, T. Tillo, and M. Gabbouj, "A paradigm for dynamic adaptive streaming over http for multi-view video," in *Pacific-Rim Conference on Multimedia, Gwangju, Korea*, 2015.
- [12] Z. Jin, T. Tillo, and F. Cheng, "Planar surfaces detection on depth map using patch based approach," in *Consumer Electronics (GCCE), 2014 IEEE 3rd Global Conference on*, pp. 227–229, Oct 2014.
- [13] Z. Jin, T. Tillo, and F. Cheng, "Depth-map driven planar surfaces detection," in *Visual Communications and Image Processing Conference, 2014 IEEE*, pp. 514–517, Dec 2014.
- [14] L. Yu, J. Xiao, and T. Tillo, "Dynamic redundancy allocation for video streaming using sub-gop based fec code," in *Visual Communications and Image Processing Conference, 2014 IEEE*, pp. 518–521, Dec 2014.
- [15] H.-N. Liang, C. Fleming, K. L. Man, and T. Tillo, "A first introduction to programming for first-year students at a chinese university using lego mindstorms," in *Teaching, Assessment and Learning for Engineering (TALE), 2013 IEEE International Conference on*, pp. 233–238, Aug 2013.
- [16] C. Lin, Y. Zhao, J. Xiao, and T. Tillo, "Multiple description video coding based on forward error correction within expanding windows," in *Image Processing (ICIP), 2013 20th IEEE International Conference on*, pp. 1909–1913, Sept 2013.
- [17] J. Ma, T. Tillo, B. Zhang, Z. Wang, and E. G. Lim, "Novel training and comparison method for blood detection in wireless capsule endoscopy images," in *Medical Information and Communication Technology (ISMICT), 2013 7th International Symposium on*, pp. 56–60, March 2013.
- [18] Z. Jin, T. Tillo, J. Xiao, and F. Cheng, "3-d video depth map quantization based on lloyd's algorithm," in *IVMSP Workshop, 2013 IEEE 11th*, pp. 1–4, June 2013.
- [19] Z. Wang, E. Lim, M. Zhang, J. Wang, T. Tillo, and J. Chen, "Electromagnetic wave propagation of wireless capsule antennas in the human body," in *Antennas Propagation (ISAP), 2013 Proceedings of the International Symposium on*, vol. 01, pp. 625–628, Oct 2013.
- [20] E. G. Lim, J. C. Wang, Z. Wang, T. Tillo, K. L. Man, and N. Zhang, "Wireless capsule endoscopy," in *IAENG International MultiConference of Engineers and Computer Scientists (IMECS'13), Hong Kong*, 2013.
- [21] Z. Jin, T. Tillo, E. G. Lim, Z. Wang, and J. Xiao, "Novel wireless capsule endoscopy diagnosis system with adaptive image capturing rate," in *The 8th International Conference on Computer Vision Theory and Applications (VISAPP 2013), Barcelona, Spain*, Feb 2013.
- [22] J. Xiao, T. Tillo, C. Lin, and Y. Zhao, "Real-time video streaming exploiting the late-arrival packets," in *Picture Coding Symposium (PCS), 2012*, pp. 257–260, May 2012.
- [23] J. Li, J. Ma, T. Tillo, B. Zhang, and E. G. Lim, "A training based support vector machine technique for blood detection in wireless capsule endoscopy images," in *Biomedical Engineering and Sciences (IECBES), 2012 IEEE EMBS Conference on*, pp. 826–830, Dec 2012.
- [24] F. Cheng, J. Xiao, J. Zhi, and T. Tillo, "Video error concealment of p-frame using packets of the following frames," in *Signal Image Technology and Internet Based Systems (SITIS), 2012 Eighth International Conference on*, pp. 15–20, Nov 2012.

- [25] J. Xiao, T. Tillo, and H. Yuan, "Real-time macroblock level bits allocation for depth maps in 3-d video coding," in *Pacific-Rim Conference on Multimedia (PCM2012)*, Singapore, Dec 2012.
- [26] Y. Liu, T. Tillo, J. Xiao, E. Lim, and Z. Wang, "2d to cylindrical inverse projection of the wireless capsule endoscopy images," in *Image and Signal Processing (CISP), 2011 4th International Congress on*, vol. 1, pp. 1–5, Oct 2011.
- [27] J. Xiao, T. Tillo, and C. Lin, "Is burst loss worse than random loss for video transmission?," in *Systems, Signals and Image Processing (IWSSIP), 2011 18th International Conference on*, pp. 1–4, June 2011.
- [28] J. Xiao, T. Tillo, and X. Zhang, "Image database encoding using hybrid video encoder," in *Image and Signal Processing (CISP), 2011 4th International Congress on*, vol. 2, pp. 625–628, Oct 2011.
- [29] J. Xiao, T. Tillo, C. Lin, and Y. Zhao, "Real-time forward error correction for video transmission," in *Visual Communications and Image Processing (VCIP), 2011 IEEE*, pp. 1–4, Nov 2011.
- [30] T. Tillo, E. Lim, Z. Wang, J. Hang, and R. Qian, "Inverse projection of the wireless capsule endoscopy images," in *Biomedical Engineering and Computer Science (ICBECS), 2010 International Conference on*, pp. 1–4, April 2010.
- [31] B. Penna, T. Tillo, M. Grangetto, E. Magli, and G. Olmo, "A technique for blood detection in wireless capsule endoscopy images," in *Signal Processing Conference, 2009 17th European*, pp. 1864–1868, Aug 2009.
- [32] H. Lee, T. Tillo, and B. Jeon, "Hybrid wyner-ziv video coding structure for removing feedback channel," in *Communications, Computers and Signal Processing, 2009. PacRim 2009. IEEE Pacific Rim Conference on*, pp. 858–862, Aug 2009.
- [33] T. Tillo, H. Lee, and B. Jeon, "Invited paper: Uni-directional hybrid distributed video coding with macroblock classification," in *24th International Technical Conference on Circuits/Systems, Computers and Communications, Jeju Island, S. Korea*, Jul 2009.
- [34] E. Baccaglini, T. Tillo, and G. Olmo, "Unequal loss protection and multiple description coding: a performance comparison," in *3rd European Symposium on Mobile Media Delivery (EUMOB), London*, Sep 2009.
- [35] E. Baccaglini, T. Tillo, and G. Olmo, "Concealment driven smart slice reordering for robust video transmission," in *Multimedia and Expo, 2008 IEEE International Conference on*, pp. 1173–1176, June 2008.
- [36] E. Baccaglini, T. Tillo, and G. Olmo, "Robust distributed storage of digital cinema contents," in *Information and Communication Technologies: From Theory to Applications, 2008. ICTTA 2008. 3rd International Conference on*, pp. 1–6, April 2008.
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- [39] T. Tillo and G. Olmo, "Generating balanced descriptions using classification-based approach," in *Information and Communication Technologies, 2006. ICTTA '06. 2nd*, vol. 1, pp. 1439–1444, April 2006.
- [40] B. Penna, T. Tillo, E. Magli, and G. Olmo, "Quality assessment for hyperspectral imagery: Comparison between lossy and near-lossless compression," in *Signals, Systems and Computers, 2006. ACSSC '06. Fortieth Asilomar Conference on*, pp. 1902–1906, Oct 2006.
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- [47] B. Penna, T. Tillo, E. Magli, and G. Olmo, “Embedded lossy to lossless compression of hyperspectral images using jpeg 2000,” in *Geoscience and Remote Sensing Symposium, 2005. IGARSS '05. Proceedings. 2005 IEEE International*, vol. 1, pp. 4 pp.–, July 2005.
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- [50] T. Tillo, M. Grangetto, and G. Olmo, “Multiple description coding with error correction capabilities: an application to motion jpeg 2000,” in *Image Processing, 2004. ICIP '04. 2004 International Conference on*, vol. 5, pp. 3129–3132 Vol. 5, Oct 2004.
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Patents

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- [2] S. Li, T. Tillo, and F. Cheng, “Image processing based laserless pointer,” no. 2015106867645.
- [3] “Sub-gop based forward error correction of real-time video transmission,” no. ZL201110170067.6; publication number: CN102231837A.
- [4] “Expanding window forward error correction code for real-time video streaming,” no. 201210169952.7.

- [5] "Delay-constrained real time video communication system based on RS code," no. 201110372939.7.
- [6] "Miniature reminder system for missed calls based on bluetooth," no. 201220481135.
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General Work Experiences (Non-academic)

Jan.2000 - Souccar for Electronic Industries, Damascus, Syria

Sep.2001 *Hardware development engineer*

Feb.1999 - Ziad-Dakkak for medical instruments, Damascus, Syria

Dec.1999 *Installation engineer*

Nov.1996 - InnoElectronics (self-funded startup company), Damascus, Syria

Dec.1998 *Self-employed with partners*

Apr.1997 - Bahbouh factory, Nabek, Syria

Aug.1997 *Installation engineer (part time)*

Nov.1994 - Military service, Syria

Nov.1996 *Electronic engineer in the Electronic Warfare Department*