

CV of : **Albert J.P. THEUWISSEN**

Personal data :

Name : Theuwissen
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Education :

- PhD in Applied Sciences, graduate from K.U. Leuven, in 1983, summa cum laude,
- MSc. Electrical Engineering, from K.U. Leuven, in 1977, cum laude,

Professional courses :

- Design for testability, a management overview,
- Teaching to professionals,
- Speed-reading,
- Financial management for non-financial managers,
- Road-mapping,
- Negotiations,
- Octagon (management training),
- Manager Seminar,
- Quality Aspects of R&D
- Appraisal and evaluation of co-workers
- Reading and translating scientific Japanese,
- Digitale Image Processing,
- MatLAB,
- Camera Image Quality Assessment.

Experience :

- 2007-today : Founder and CEO of Harvest Imaging,
- 2004-2007 : Chief Scientist at DALSA Semiconductors,
- 2002-2004 : Chief Technology Officer of DALSA Inc.
- 2001-2023 : Parttime professor at Delft University of Technology,
- 1991-2002 : manager of the R&D group "Imaging Devices" of "Philips Semiconductors Image Sensors",
- 1988-1991 : Projectleader of HDTV imagers within Philips Research,
- 1985-1988 : Projectleader of SDTV imagers within Philips Research,
- 1983-1985 : Member of the scientific staff of Philips Research,
- 1977-1983 : PhD candidate at K.U. Leuven : "Use of Indium-Tin Oxide and Polyimide in CCD Technology",
- 1976-1977 : PhD candidate at K.U. Leuven: "Hardware Development of a 256-element linear CCD image sensor",

Contribution to scientific and technical committees :

- 1988, 1989, 1995, 1996, 2020, 2021 : member technical program committee IEDM, and in 2022 : subcommittee chair IEDM,
- 1997, 1998, 2003 : member technical program committee ESSDERC,
- 1999-2010 : member technical program committee ISSCC,
- 2001-2006 : secretary, vice-chair and chair European ISSCC Committee and member Executive Committee ISSCC,
- 2009-2010 : vice-chair and chair of the technical program committee of ISSCC,
- since 1995 : member steering committee of International Image Sensor Workshop,
- 1997, 2003, 2009, 2015 : general chair of International Image Sensor Workshop,
- 1997 : founder "Walter Kosonocky Award",
- 1996-2022 : member "editorial board" of Photonics Spectra,
- 1991, 1997, 2003, 2009 : guest co-editor of special issue IEEE Trans. Electron Devices on Image Sensors;
- 2015 : guest editor-in-chief of special issue IEEE Trans. Electron Devices
- 1998 : co-editor of special issue IEEE Micro on Digital Imaging,
- 1998-2004; 2015-2016 : IEEE distinguished lecturer,
- 2017-2021 : President of the International Image Sensor Society.

Awards :

- 2008 : Fuji Gold Medal (SMPTE)
- 2012 : Electronic Imaging Scientist of the Year (SPIE)
- 2013 : Exceptional Service Award (IISS),
- 2014 : SEMI-Award.

Major Technical Achievements :

- CCD and CMOS on a single chip ('85),
- Two dimensional stitching for large-area imagers ('88),
- Local W-interconnect to strap CCD gates ('89),
- Wafer-size CCD imager with 66 Mpixels ('93),
- Aspect ratio switching by Dynamic Pixel Management ('96),
- CCD imager with 2.4 μm pixel pitch ('98),
- Imager with 1 M frames/s ('01),
- World record dark current for imagers ('04),
- Multi-slope, multi-ramp column-parallel ADC ('06),
- Image sensor with 0.7 electrons of noise ('11),
- World record low noise level (30 μV) in a CMOS imagers ('17),
- CMOS image sensor with single electron detection ('20).

Completed PhD projects (at TU Delft and under guidance of A. Theuwissen) :

- Martijn Snoeij : "Analog Signal Processing for CMOS Image Sensors",
- Xinyang Wang : "Noise in sub-micron CMOS Image Sensor Pixels",
- Padmakumar Rao : "Device Physics Aspects of CMOS Image Sensors",
- Mukul Sarkar : "Biologically Inspired CMOS Image Sensor",
- Yue Chen : "High-Performance CMOS Image Sensor for Radio Molecular Imaging",
- Ning Xie : "Low Noise, Low Power CMOS Image Sensor",
- Jiaming Tan : "4T CMOS Active Pixel Sensors under Ionizing Radiation",

- Yang Xu : “Fundamental Characteristics of Pinned-Photodiode Pixels in CMOS Imagers”,
- Fei Wang : “Linearity Research of a CMOS Image Sensor”,
- Accel Abarca Prouza : “In-Pixel Temperature Sensos for Dark Current Compensation of a CMOS Image Sensor”,
- Xiaoliang Ge : “Temporal Noise Reduction in CMOS Image Sensors”.

Completed MSc projects (at TU Delft and under guidance of A. Theuwissen) :

- Ning Xie : “CMOS image sensor in 0.18 μm technology for a micro-digital sun sensor”,
- Kejia Ruan : “A novel readout architecture for a CMOS linescan image sensor”,
- Yang Xu : “Charge domain interlacing CMOS image sensor design”,
- Cheng Ma : “Pixel ADC design for hybrid CMOS image sensors”,
- Jia Guo : “A DLL based single slope ADC”,
- Yang Liu : “Design of a HDR CMOS Image Sensor in 110 nm Technology”,
- Xiaoliang Ge : “Design of a Global Shutter CMOS Image Sensor in 110 nm CMOS Technology”,
- Qiang Yao : “The design of a 16x16 pixels CMOS image sensor with 0.5 e^- rms noise”,
- Jiaqi Zhu : “The design of a stitched high dynamic range CMOS particle sensor”,
- Ruijun Zhang : “A 1-Mega Pixel HDR and UV Sensitive Image Sensor with Interleaved 14-bit 64 Ms/s SAR ADC”,
- Jules Markenhof : “integrating a Temperature Sensor into a CMOS Image Sensor”,
- Utsav Jain : “Characteristics of CMOS Image Sensors”,
- Fjola Osp Snaevardottir : “CMOS Image Sensor Design Methodology”,
- Periklis Stampoglis : “The design of a high speed CMOS image sensor”,
- Mingzhe Chen : “1D-ToF : system modeling, processing algorithm, design, implementation”,
- Yu-Chieh Tai : “On-Chip Temperature Compensation with a Reference Voltage Method for CMOS Image Sensors”.

Publications (for details see further) :

- Over 270 publications in the field of Imaging (see www.harvestimaging.com)
- 1995 : publication of the textbook “Solid-State Imaging with Charge-Coupled Devices”,
- More than 25 (pending) patents in the field of Imaging
- More than 290 workshops/courses/trainings around the theme of “Solid-State Image Sensors”, including tailored in-house trainings for Philips, ASML, Nokia, Motorola, Sony-Ericsson, ams, ON Semiconductors, CMOSIS, DALSA, Infineon, ST Microelectronics, Broadcom, Siemens, Zeiss, GPixel, imec, FEI, AXIS, Wolfson Electronics, Robert Bosch, Teledyne, Leica, Fraunhofer IMS, EPO, USPTO, Intel, Facebook, Forza Silicon, Google, Spectricity, OmniVision Technologies, Supaero, ...

September 2024.

List of Publications/Presentations :

1. **A. Theuwissen, A. Vits, J.P. Vermeiren** : "Analysis of traffic flow with a CCD-camera and a micro-processor", Journal A, Vol. 21, no. 3, p.112-115, 1980.
2. **A. Theuwissen, G. Declerck** : "Technology of CCD-imagers with transparent conductive ITO-electrodes", 10th ESSDERC/5th SSSDT, York (UK), Conf. Abstr. p.216-217, Sept. 15-18, 1980.
3. **A. Theuwissen, G. Declerck** : "Linear CCD-imagers with a Poly-imide Insulation for Double Level Metallization", IEEE Electr. Dev. Lett., Vol. EDL-3, p.308-309, 1982.
4. **A.J.P. Theuwissen, G. Declerck** : "Optical and Electrical Properties of Reactively DC-Magnetron Sputtered $\text{In}_2\text{O}_3\text{:Sn}$ Films", Thin Solid Films, Vol. 121, p.109-119, 1984.
5. **J. van der Spiegel, J. Sevenhans, A. Theuwissen, J. Bosiers, I. Debusschere, G. Declerck** : "Study of different sensor types for high resolution linear CCD-imagers", Sensors and Actuators, Vol. 6, p.51-64, 1984.
6. **A.J.P. Theuwissen, C.H.L. Weijtens, L.J.M. Esser, J.N.G. Cox, H.T.A.R. Duyvelaar, W.C. Keur** : "The Accordion Imager : an ultra-high density Frame Transfer CCD", IEDM 84, San Francisco, Techn. Dig. p.40-43, 1984.
7. **M.G. Collet, J.G.C. Bakker, L.J.M. Esser, H.L. Peek, M.J.H. van de Steeg, A.J.P. Theuwissen, C.H.L. Weijtens** : "High Density Frame Transfer Image Sensors with Vertical Anti-Blooming", SPIE Vol. 570 Solid State Imaging Arrays, San Diego, p.27-34, 1985.
8. **A.J.P. Theuwissen, C.H.L. Weijtens, J.N.G. Cox** : "The Accordion Imager : more than just a CCD-sensor", Electronic Imaging '85, Boston, p.87-90, Oct. 7-10, 1985.
9. **A. Theuwissen** : "The Accordion Imager", Proc. Intern. Congress of Photographic Science : Progress in Basic Principles of Imaging Systems, Koln, p.638, Sept. 10-17, 1986.
10. **A.J.P. Theuwissen, C.H.L. Weijtens** : "The accordion imager, a new solid-state image sensor", Philips Technical Review, Vol.43, p.1-8, 1986.
11. **A.J.P. Theuwissen, J.G.C. Bakker, J.N.G. Cox, A.L. Kokshoorn, P.A.C. van Loon, B.C.J. O'Dwyer, J.M.A.M. Oppers, C.H.L. Weijtens** : "A 400k pixel 1/2" Accordion CCD-Imager", ISSCC, San Francisco, Digest Tech. Papers, p.48-49, Febr. 17-19, 1988.
12. **L.J.M. Esser, H.C.G. van Kuijk, J.G.C. Bakker, C.H.L. Weijtens, A.J.P. Theuwissen** : "A Smearfree Accordion CCD-Imager", Intern. Conf. Consumer Electronics, Rosemont, p.10-11, June 8-10, 1988.
13. **A.J.P. Theuwissen** : "Recente Ontwikkelingen op het gebied van CCD-imagers", MediAVISie, Amsterdam, 18-21 sept., 1989.
14. **A.J.P. Theuwissen** : "CCD-imagers for HDTV", Workshop on Advanced Solid-State Imagers, Harriman (NY), May 18-20, 1990.
15. **A.J.P. Theuwissen** : "Charge-Coupled Devices als Bildaufnehmer", Elektronik, No. 23, p. 76-84, 1990.
16. **J.G.C. Bakker, L.J.M. Esser, H.L. Peek, C.J. Sweeney, A.L. Kokshoorn, A.J.P. Theuwissen** : "The Tacking CCD : A new CCD concept.", IEEE Transac. Electr. Dev., Vol. ED-38, p. 1193-1200, May 1991.
17. **Theuwissen, H. Peek, P. Centen, R. Boesten, J. Cox, P. Hartog, A. Kokshoorn, H. van Kuijk, B. O'Dwyer, J. Oppers, F. Vledder** : "A 2.2 Mpixel FT-CCD imager according to the Eureka HDTV-standard.", IEDM 91, Washington DC, Techn. Dig. p. 167-170, 1991.
18. **A. Theuwissen, H. Peek, P. Centen, M. van de Steeg, R. Boesten, P. Hartog, A. Kokshoorn, E. de Koning, J. Oppers, F. Vledder** : "HDTV image sensor : the pixel structure.", Intern. Broadcast Convention, Amsterdam, Techn. Papers, p. 488-491, July 1992.
19. **A. Theuwissen** : "HDTV image sensors.", (invited paper) IS&T Proceedings of the Intern. Symp. on Electr. Photography, Koln (Germ.), Sept. 1992, p. 12-16.
20. **M. van de Steeg, R. Boesten, P. Centen, P. Hartog, A. Kokshoorn, E. de Koning, J. Oppers, H. Peek, A. Theuwissen, F. Vledder** : "CCD-Imagers for HDTV.", "Imaging the Future", Cambridge (UK), 22-25 Sept., 1992. Also The Journal of Photographic Science, Vol. 41, No. 3, 1993, p. 117-118.

21. **J. Blankevoort, H. Blom, P. Brouwer, B. van de Herik, R. Koppe, A. Moelands, J. van Rooy, F. Stok, A. Theuwissen** : "A high performance, full bandwidth, HDTV camera, applying the first 2.2 million pixel Frame Transfer CCD sensor.", 134th SMPTE Techn. Conf., Toronto (Can), Nov. 10-13, 1992.
22. **A.J.P. Theuwissen, H.L. Peek, M.J.H. van de Steeg, R.M.G. Boesten, P.B. Hartog, A.L. Kokshoorn, E.A. de Koning, J.M.A.M. Oppers, F.F. Vledder, P.G.M. Centen, H. Blom, W. Haar** : "A 2.2M Pixel FT-CCD Imager According to the Eureka HDTV Standard.", IEEE Transac. Electron Devices, Vol. 40, No. 9, Sept. 1993, p. 1621-1629.
23. **L.J.M. Esser, A.J.P. Theuwissen** : "Charge Coupled Devices : Physics, Technology and Imaging", in "Handbook on Semiconductors" ed. by T.S. Moss, Vol.4, ed. by C. Hilsum, Elsevier Science Publ., 1993, p. 389-473.
24. **H. Peek, A. Theuwissen, A. Kokshoorn, E. Daemen** : "Groove-fill of tungsten and poly-Si membrane technology for high performance (HDTV) FT-CCD imagers.", IEDM 93, Washington DC, Techn. Dig. p. 567-570, 1993.
25. **A. Theuwissen** : "CCD-Imaging", Sensor Technology 1994, University of Twente, conference proceedings, p. 51-66, 1994.
26. **A. Theuwissen** : "CCD-Imaging", Philips Journal of Research, Vol. 48, No. 3, p.147-158, 1994.
27. **P. Centen, H. Stoldt, A. Theuwissen, H. Peek, W. Huinink, L. Sankaranarayanan, A. Kleimann, G. Pine, M. Stekelenburg, A. Mierop, F. Vledder, D. Verbugt, J. Oppers, P. Opmeer** : "Aspect ratio switching with equal horizontal pixel count.", Intern. Broadcast Convention, Amsterdam, Techn. Papers, p. 1-7, September 1994.
28. **A.J.P. Theuwissen** : "Die leise Revolution der sehenden Chips", Bulletin VSE-UCS, No. 21, 1994, p. 19-23.
29. **A. Theuwissen, J. Bosiers, H. Heijns, G. Kreider, H. Peek, E. Roks, C. Schaeffer, H. Stoldt** : "Real-time imaging with mega-pixel charge-coupled devices.", Proc. Intelligent Robots and Computer Vision XIII : 3D Vision, Product Inspection, and Active Vision, SPIE Vol. 2354, Boston, 2-4 Nov. 1994, pp.240-248.
30. **A. Theuwissen** : "Broadcast CCD Imagers find new Applications", Photonics Spectra, Jan. 1995, p. 109.
31. **A.J.P. Theuwissen** : "Solid-State Imaging with Charge-Coupled Devices", Kluwer Acad. Publishers, Dordrecht, ISBN 079-233456-6, April 1995.
32. **A. Theuwissen, J. Bosiers** : "Consumer CCDs : masterpieces of 3D integration, Optics & Photonics News, April 1995, pp. 32-36.
33. **E. Roks, A. Theuwissen, H. Peek, M. van de Steeg, P. Centen, J. Bosiers, D. Verbugt, E. de Koning** : "A low-noise, highly sensitive 1", 2.2 Mpixel FT-CCD imager for high-definition applications, 1995 IEEE Workshop on Charge-Coupled Devices and Advanced Imager Sensors, Dana Point, April 20-22, 1995.
34. **P. Centen, A. Mierop, H. Stoldt, A. Theuwissen, G. Pine, M. Stekelenburg** : "Dynamic Pixel Management for second generation aspect ratio switching", 19th Intern. Television Symposium and Technical Exhibition, Montreux, June 8-13, 1995, pp. 99-106.
35. **G. Kreider, J. Bosiers, B. Dillen, J. Van der Heijden, W. Hoekstra, A. Kleimann, P. Opmeer, J. Oppers, H. Peek, R. Pellens, A. Theuwissen** : "An mK x nK Modular Image Sensor Design", IEDM 95, Washington DC, Dig. Techn. Papers, p. 155-158, 1995.
36. **A. Theuwissen** : "Large area imagers for Digital Photography", (invited paper) Intern. Symp. on Electr. Photography, Koln (Germ.), 21-22 Sept. 1996.
37. **A. Theuwissen** : "Modular CCD concept for large area CCD imagers", ESO Workshop Optical detectors for Astronomy, 8-10 October, 1996, Proceedings pp. 37-44, Kluwer Acad. Publ., 1998.
38. **H. Stoldt, A.J.P. Theuwissen, F.F. Vledder, P.G.M. Centen, A. Mierop, A.C.M. Kleimann, H.L. Peek, D.W.E. Verbugt, P.B. Hartog, R.H.S. de Gruyter** : "CCD Imagers for Broadcast Applications" (invited paper), IEDM 96, San Francisco, Dig. Techn. Papers, 1996.
39. **A. Theuwissen** : "Modular CCDs", Photonics Spectra, Jan. 1997, p. 110-112.
40. **A. Theuwissen** : "State-of-the-art and future developments in CCD image sensors", 7. SGOEM Fachkurs Bildgebende Optische Messtechnik 1997, 10-14 March, Engelberg (CH).

41. **A. Theuwissen** : "Image Sensing for Electronic Photography", 7. SGOEM Fachkurs Bildgebende Optische Messtechnik 1997, 10-14 March, Engelberg (CH).
42. **H. Folkerts, E. Roks, L. Korthout, A. Theuwissen** : "Characterization of building block imagers with respect to linear dynamic range", 1997 IEEE Workshop on Charge-Coupled Devices and Advanced Image Sensors, Bruges, June 5-7, 1997.
43. **M. Lesser, D. Ouellette, A. Theuwissen, G. Kreider, H. Michaelis** : "Packaging and operation of Philips 7K x 9K CCDs", 1997 IEEE Workshop on Charge-Coupled Devices and Advanced Image Sensors, Bruges, June 5-7, 1997.
44. **A.J.P. Theuwissen** : "Dynamic Range : Buyers Need Comparable Specifications", Photonics Spectra, November 1997, p. 161-163.
45. **A. Theuwissen, M. Beenhakkers, B. Dillen, H.O. Folkerts, H. Heyns, L. Korthout, G. Kreider, P. Opmeer, H. Peek, E. Roks, H. Rosner, A. van der Sijde, F. Vledder** : "Versatile building-block architecture for large area, high performance CCD imagers", Proceedings of SPIE, Vol. 3301, pp. 37-43, San Jose, Jan. 26-27, 1998.
46. **A.J.P. Theuwissen** : moderator of the ISSCC Evening Panel Discussion on "Will CMOS Image Sensors Survive Scaling ?", San Francisco (CA), Feb. 5-7, 1998.
47. **A. Theuwissen** : "Versatile building-block architecture for large area, high performance CCD imagers", (invited paper) Proceedings ESSDERC'98, Bordeaux (Fr), Sept. 8-10, 1998, pp. 56-61.
48. **Albert J.P. Theuwissen** : "Solid-state Imaging Devices for Digital Photography", ICPS, Sept. 7-11, 1998, Antwerp, pp. 326-329.
49. **Albert Theuwissen** : "Update on today's CCD technology", Europractice "CMOS image sensors, technology and applications", 16th September, 1998, Southampton, UK.
50. **Albert Theuwissen** : "Update on today's CCD technology", Europractice "CMOS image sensors, technology and applications", 30th September, 1998, Stuttgart, Germany, UK.
51. **Albert J.P. Theuwissen** : "Professional digital photography : state-of-the-art", Seybold seminars, March 2-5, 1999, Boston.
52. **Albert Theuwissen** : "Update on today's CCD technology", BIVA meeting on "CMOS image sensors, technology and applications", 26th May, 1999, Stuttgart, Germany, UK.
53. **H.-S. Philip Wong and Albert J.P. Theuwissen** : "Guest Editor's Introduction : Digital Imaging", IEEE Micro, Vol.18, 1998, no. 6, pp.12-13.
54. **A.J.P. Theuwissen** : "CMOS or CCD image sensors for digital still applications ?", invited paper ESSCIRC, Duisburg, 21-23 Sept. 1999, p. 28.
55. **A.J.P. Theuwissen** : " Solid-State Image Sensors for Digital Photography", 6th October, 1999, VDI-Vortrag, Koln.
56. **Albert Theuwissen** : "For Pixels, Size Matters", Photonics Spectra, August 2000, pp. 112-113.
57. **Albert Theuwissen and Edwin Roks** : "Building a better mousetrap, modified CMOS processes improve image sensor performance.", OE Magazine, Jan. 2001, pp. 29-32.
58. **Albert J.P. Theuwissen** : "What you see is what you get ?!", Seybold seminar, April 12, 2001, Boston.
59. **Albert J.P. Theuwissen** : "CMOS or CCD image sensors for digital still applications ?", invited paper, Proc. VLSI-TSA Symposium, Hsinchu (Taiwan), April 18-20, 2001, pp. 168-171.
60. **C. Draijer, G. Kreider, B. Dillen, W. Klaassens, H. Peek, A. Theuwissen** : "A Color Image Sensor with 9 μ m Pixels for High-End Digital Still Photography", 1999 IEEE Workshop on Charge-Coupled Devices and Advanced Image Sensors, Lake Tahoe, June 7-9, 2001.
61. **D. Poggemann, T.G. Etoh, A. Ruckelshausen, G. Kreider, A. Theuwissen, Y. Kondo, H. Maruno, K. Takubo, H. Soya** : "An Ultra-High-Speed Camera with an In-situ Storage Image Sensor for Preliminary Test", 1999 IEEE Workshop on Charge-Coupled Devices and Advanced Image Sensors, Lake Tahoe, June 7-9, 2001.
62. **Albert Theuwissen** : "Solid-State Imaging Devices", contribution to Encyclopedia of Physical Science and Technology, third edition, Academic Press, 2001.
63. **L. Le Cam, J. Bosiers, A. Kleimann, H. van Kuijk, J. Maas, M. Beenhakkers, H. Peek, P. van der Rijt, A. Theuwissen** : "A 1/1.8" 3M-pixel FT-CCD with On-Chip

- Horizontal Sub-Sampling for DSC Applications", ISSCC, San Francisco, Digest Tech. Papers, p. 34-35, Febr. 4-6, 2002.
64. **T.G. Etoh, D. Poggemann, A. Ruckelshausen, A. Theuwissen, G. Kreider, H.-O. Folkerts, H. Mutoh, Y. Kondo, H. Maruno, K. Takubo, H. Soya, K. Takehara, T. Okinaka, Y. Takano, T. Reisinger, C. Lohmann** : "A CCD Image Sensor of 1M frames/s for Continuous Image Capturing of >100 Frames.", ISSCC, San Francisco, Digest Techn. Papers, p. 46-47, Febr. 4-6, 2002.
 65. **J.T. Bosiers, A.C. Kleimann, H.C. van Kuijk, L. Le Cam, H. Peek, J. Maas, A.J. Theuwissen** : "Frame Transfer CCDs for Digital Still Cameras : Concept, Design and Evaluation", IEEE Transac. Electron Devices, Vol. 49, p. 377-386, 2002.
 66. **Albert J.P. Theuwissen** : "Small is Beautiful ?! Yes, but not for pixels of solid-state imagers", Invited talk at the PICS Conference, Conf. Proc., p. 156-157, April 7-10, 2002, Portland (OR).
 67. **Albert J.P. Theuwissen** : "Small is Beautiful ?! Yes, but not for pixels of solid-state imagers.", Invited talk at the 1st Fraunhofer CMOS Image Sensor Workshop, May 6-7, 2002, Duisburg (Germany).
 68. **Albert J.P. Theuwissen** : "Effect of shrinking pixels in solid-state image sensors", Journee d'Etudes – Les capteurs d'images CCD-CMOS Etat de l'Art, Paris (France), June 10, 2002.
 69. **Albert Theuwissen** : "CCD Developments", 3. Z/I Imaging Recce-Workshop, June 11-13, 2002, Oberkochen (Germany).
 70. **M.F. Snoeijs, A.J.P. Theuwissen and J.H. Huijsing** : "Read-Out Circuits for Reduction of Fixed-Pattern Noise in a CMOS Active Pixel Sensor", Proc. of the Semiconductor Sensors Conference SeSENS, Veldhoven (NI), pp. 676-679, Nov. 2002.
 71. **D. Poggemann, T.G. Etoh, A. Ruckelshausen, A. Theuwissen, J. Bosiers, H. Mutoh, Y. Kondo** : "Simulation-based development and characterization of a CCD architecture for 1 million frames per second", Proceedings of SPIE, Vol. 5017, p. 185-195, Santa Clara, Jan. 21-23, 2003.
 72. **A. Tanbakuchi, A. van der Sijde, B. Dillen, A. Theuwissen, W. de Haan** : "Adaptive Pixel Defect Correction", Proceedings of SPIE, Vol. 5017, p. 360-370, Santa Clara, Jan. 21-23, 2003.
 73. **N.V. Loukianova, H.O. Folkerts, J.P.V. Maas, D.W.E. Verbugt, A.J. Mierop, W. Hoekstra, E. Roks, A.J.P. Theuwissen** : "Leakage Current Modeling of Test Structures for Characterization of Dark Current in CMOS Image Sensors", IEEE Transac. Electron Devices, Vol. 50, No. 1, Jan. 2003, p. 77-83.
 74. **T.G. Etoh, D. Poggemann, G. Kreider, H. Mutoh, A.J.P. Theuwissen, A. Ruckelshausen, Y. Kondo, H. Maruno, K. Takubo, H. Soya, K. Takehara, T. Okinaka, Y. Takano** : "An Image Sensor Which Captures 100 Consecutive Frames at 1,000,000 Frames/s", IEEE Transac. Electron Devices, Vol. 50, No. 1, Jan. 2003, p. 144-151.
 75. **J.T. Bosiers, B.G.M. Dillen, C. Draijer, A.C. Kleimann, F.J. Polderdijk, M.A.R.C. de Wolf, W. Klaassens, A.J.P. Theuwissen, H.L. Peek, H.O. Folkerts** : "A 35 mm Format 11 M Pixel Full-Frame CCD for Professional Digital Still Imaging", IEEE Transac. Electron Devices, Vol. 50, No. 1, Jan. 2003, p. 254-265.
 76. **Albert Theuwissen, John Coghill, Lucian Ion, Felicia Shu, Harald Siefken, Charles Smith** : "Ultra-high Resolution Image Capturing and Processing for Digital Cinematography", ISSCC, San Francisco, Digest Tech. Papers, p.162-163, Febr. 9-13, 2003.
 77. **Anthony A. Tanbakuchi, Arjen van der Sijde, Bart Dillen, Albert Theuwissen, Wim de Haan** : "Adaptive Pixel Defect Correction", poster at the University of Arizona Annual Photonics and Imaging Initiative Workshop, Marriott Hotel Tucson (AR), Jan. 21-23, 2004.
 78. **Albert J.P. Theuwissen** : "Photography on Mars", Invited opening talk at North American Photography Festival "Contact", May 1, 2004, Toronto (ON).
 79. **Albert J.P. Theuwissen** : "Characteristics of CMOS Image Sensors", Invited talk at the 2nd Fraunhofer CMOS Image Sensor Workshop, May 25-26, 2004, Duisburg (Germany).
 80. **Albert J.P. Theuwissen** : "Photography on Mars", Journee d'Etudes – Les capteurs d'images CCD-CMOS Etat de l'Art, Paris (France), June 4, 2004.

81. **Albert J.P. Theuwissen** : "Image Processing Chain in a Digital Still Camera", Invited plenary talk at IEEE Symposium on VLSI Circuits, Honolulu (HA), June 17-19, 2004.
82. **Albert J.P. Theuwissen** : "Image Sensors for Ambient Intelligence Applications", Invited talk at Philips Symposium on Hardware Drivers for Ambient Intelligence, Dec. 9-10, 2004, Veldhoven (the Netherlands).
83. **M.F. Snoeij, A.J.P. Theuwissen, J.H. Huijsing** : "A 1.8 V 3.2 μ W Comparator for Use in a CMOS Imager Column-Level Single-Slope ADC", ISCAS2005, Kobe, May 2005.
84. **M.F. Snoeij, A.J.P. Theuwissen, J.H. Huijsing** : "A Low-Power Column-Parallel 12-bit ADC for CMOS Imagers", IEEE Workshop on CCDs and Advanced Image Sensors, Karuizawa, June 9-11, 2005.
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213. **Fei Wang, Albert Theuwissen** : “Linearity analysis of a CMOS image sensor”, Award winning best student paper at 2009 Electronic Imaging, San Francisco, Jan. 30 - Feb. 2, 2017.
214. **Albert Theuwissen** : “NOISE : You Love It or You Hate It”, Webinar IEEE-SSCS, recorded February 6, 2017.
215. **Eric R. Fossum, Nobukazu Teranishi, Albert Theuwissen, David Stoppa, Edoardo Charbon**, editors : “Photon-Counting Image Sensors”, MDPI, ISBN 978-3-03842-374-4, 2017,
216. **Xiaoliang Ge, Albert Theuwissen** : “A 0.5e⁻ Temporal Noise CMOS Image Sensor with Charge-Domain CDS and Period-Controlled Variable Conversion Gain”, 2017 International Image Sensor Workshop, Hiroshima (Japan), May 30- June 2, 2017, pp. 290-293,
217. **Fei Wang, Liqiang Han, Albert Theuwissen** : “A Highly Linear CMOS Image Sensor with a Digitally Assisted Linearity Calibration Method”, 2017 International Image Sensor Workshop, Hiroshima (Japan), May 30-June 2, 2017, pp. 336-369,
218. **Albert Theuwissen** : “CMOS Image Sensors : Masterpieces of 3D Integration”, Invited talk at Schleswig-Holsteinischen Bildverarbeitungstagen 2017, Ahrensburg (Germany), June 8th, 2017,
219. **Accel Abarca, Shuang Xie, Jules Markenhof, Albert Theuwissen** : “Temperature Sensors Integrated into a CMOS Image Sensor”, Proceedings of EuroSensors, p.358, Paris, Sept. 3-6, 2017. See also : Sensors, open access <http://www.mdpi.com/2504-3900/1/4/358/pdf>,
220. **Albert Theuwissen** : “Recent Developments in CMOS Image Sensors”, invited talk at 2nd EMVA Forum, Sept. 6-8, 2017, Vienna (Austria),
221. **S. Xie, A. Abarca, J. Markenhof, X. Ge, A. Theuwissen** : “Analysis and calibration of process variations for an array of temperature sensors”, IEEE Sensors Conference, Glasgow (United Kingdom), Oct 30-Nov 1, 2017,

222. **Fei Wang and Albert Theuwissen** : “Techniques for Pixel-Level Linearity Optimization”, Workshop on CMOS Image Sensors for High-Performance Applications, Toulouse, November 2017,
223. **Xiaoliang Ge, Albert Theuwissen** : “A 0.5e Temporal Noise CMOS Image Sensor with Gm-Cell-Based Pixel and Period-Controlled Variable Conversion Gain”, IEEE Transactions on Electron Devices, Dec. 2017, pp. 5019-5026,
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225. **Xiaoliang Ge and Albert Theuwissen** : “Temporal Noise Analysis of Charge-domain Sampling readout Circuits for CMOS Image Sensor”, Sensors, open access <http://www.mdpi.com/1424-8220/18/3/707>,
226. **Albert Theuwissen** : “Why Hybrid Image Sensor have a hard time to beat Monolithic CMOS Image Sensors”, Image Sensors Europe, London (UK), March 14-15, 2018,
227. **Albert Theuwissen** : “Fundamentals of Noise in Image Sensors”, invited talk at PHAER Vision Expert Day, Ghent, March 26, 2018,
228. **Albert Theuwissen** : “Data Sheets versus Real Performance”, invited talk at PHAER Vision Expert Day, Ghent, March 26, 2018,
229. **Albert Theuwissen** : “From Smart to Smarter : Recent Developments in CMOS Image Sensors”, invited talk at Smart System Integration Conference, Dresden, April 12, 2018,
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232. **Fei Wang, Albert J.P. Theuwissen** : “Pixel Optimizations and Digital Calibration Methods of a CMOS Image Sensor Targeting High Linearity” IEEE Transactions on Circuits and Systems, Vol. 66, March 2019, pp. 930-940,
233. **Shuang Xie, Albert Theuwissen** : “Compensation for Process and Temperature Dependency in a CMOS Image Sensor”, Sensors, Vol. 19, 870, 2019, pp. 1-14,
234. **Albert Theuwissen** : “Datasheets vs. Real Performance of CMOS Image Sensors”, invited talk at the 9th Fraunhofer CMOS Image Sensor Workshop, May 8-9, 2019, Duisburg (Germany).
235. **Shuang Xie and Albert Theuwissen** : “Temperature Sensors Incorporated into a CMOS Image Sensor with Column Zoom ADCs”, Award winning best paper at IEEE ISCAS 2019, Sapporo (Japan), May 26-29, 2019,
236. **Shuang Xie, Xiaoliang Ge and Albert Theuwissen** : “A CMOS Image Sensor with Improved Readout Speed using Column SAR ADC with Digital Error Correction”, IEEE ISCAS 2019, Sapporo (Japan), May 26-29, 2019,
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238. **Shuang Xie, Accel Abarca Prouza and Albert Theuwissen** : “CMOS-Imager-Pixel-Based Temperature Sensor for Dark Current Compensation”, 2019, also published later in IEEE Transactions on Circuits and Systems II, Vol. 67, 2020, pp. 255-259,
239. **Shuang Xie and Albert Theuwissen** : “Suppression of spatial and temporal noise in a CMOS image sensor”, IEEE Sensors Journal, 2019,
240. **Shuang Xie and Albert Theuwissen** : “A CMOS-Imager-Pixel-Based Temperature Sensor for Dark Current Compensation”, IEEE Transactions on Circuits and Systems II, 2019,
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245. **Albert Theuwissen** : “Deep Trench Isolation is Here to Stay”, invited talk at 73rd Heidelberger Bildverarbeitungsforum, Stuttgart, Oct 1st, 2019,
246. **Jaekyum Lee, Albert Theuwissen** : “10b 1MS/s column parallel SAR ADC for high speed CMOS image sensors with offset compensation technique using analog summation method”, Scientific CMOS Image Sensors Workshop, Toulouse, 26-27 November 2019,
247. **Albert Theuwissen** : “Deep Trench Isolation is Here to Stay”, invited talk at Image Sensors Europe Conference, London, March 11-12, 2020,
248. **Shuang Xie and Albert Theuwissen** : “A CMOS image sensor with a 10 MHz continuous column readout speed using digitally calibrated pipelined ADCs”, Microelectronics Journal, Vol.99, 2020, doi.org/10.1016/j.mejo.2020.104758,
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252. **Albert Theuwissen** : “Deep Trench Isolation : the Holy Grail for CMOS Image Sensors ?”, keynote talk at Electronic Imaging, San Francisco, January 18-21, 2021,
253. **Albert Theuwissen** : “There’s More To The Picture Than Meets The Eye”, Plenary Talk at the International Solid-State Circuits Conference, San Francisco, February 13-21, 2021, (<https://www.youtube.com/watch?v=TDYqIJFREQ4&t=419s>).
254. **Liqiang Han, Albert J.P. Theuwissen** : “A Deep Sub-Electron Temporal Noise CMOS Image Sensor with Adjustable Sinc-type Filter to Achieve Photon Counting Capability”, IEEE Solid-State Circuit Letters, Vol. 4, 2021,
255. **Weihan Hu, Albert Theuwissen** : “A Multi-Junction Photodetector with Dual Four Transistor Structure to Detect Visible and Near-infrared Light in One Single Pixel”, IISW 2021, September 20-23, 2021,
256. **Albert Theuwissen, Guy Meynants** : “Welcome to the World of Single-Slope Column-Level Analog-to-Digital Converters for CMOS Image Sensors”, published in Foundations and Trends in Integrated Circuits and Systems, Vol. 1, Issue 1, ISSN: 2693-9347, 2021,
257. **Jaekyum Lee, Albert Theuwissen** : “An offset calibration technique for CIS column parallel SAR ADC using memory”, Electronic Imaging, San Francisco, 2022,
258. **Albert Theuwissen** : “Angular Light Sensitivity and Shutter Efficiency”, Image Sensor Europe Conference, London, May 9-10, 2022,
259. **Albert Theuwissen** : “Case Study of a Global Shutter CIS - Part 1 : Angular Dependency of the Light Sensitivity”, IEEE Transactions on Electron Devices, Vol. 69, June 2022, pp. 2932-2937,
260. **Albert Theuwissen** : “Case Study of a Global Shutter CIS – Part 2 : Parasitic Light Sensitivity”, IEEE Transactions on Electron Devices, Vol. 69, June 2022, pp. 2938-2942,
261. **Albert Theuwissen** : “Past, present and future of stacked CIS”, ESSCIRC-ESSDERC Workshop “Wafer-level 3D Stacked Imagers : Technologies and Sensors Architectures”, Milano (Italy), September 19th, 2022,
262. **Albert Theuwissen** : “Temperature Dependence of CIS Performance Parameters”, Image Sensor Europe Conference, London, March 15-16, 2023,
263. **Accel Abarca, Albert Theuwissen** : “Dark Current Compensation of a CMOS Image Sensor by Using In-Pixel Temperature Sensors”, International Image Sensor Workshop, Edinburg (UK), May 2023,
264. **Sandra Kanjirakkatraveendran, Padmakumar Rao, P.M. Sherna, Hande Aydogmus, Francesco Stallone, Albert Theuwissen** : “Towards the Holy Grail :

- CMOS-compatible, (Near-) Infrared Image Sensors”, Infrared Detection for Space Applications, Toulouse (France), June 7-9, 2023,
265. **Albert Theuwissen** : “CIS Stacking Technology : Past, Present and Future”, E-Picture This Workshop, Delft (NL), June 21, 2023,
266. **Jaekyum Lee, Albert Theuwissen** : “A linearity improvement method for CIS column-parallel SAR ADC using two-step conversion”, ESSDERC, Lisbon (P), September 2023,
267. **Albert Theuwissen** : “Stacking Technology : Past, Present, Future”, EMVA Conference, October 11-12, 2023, Wageningen (NL),
268. **Albert Theuwissen** : “Introduction to CMOS Image Sensors”, Day of Detection, Oct. 23-25, 2023, Padova (I).
269. **Accel Abarca and Albert Theuwissen** : “A CMOS Image Sensor Dark Current Compensation Using In-Pixel Temperature Sensors”, Sensors 2023, Special issue on the 2023 International Image Sensor Workshop, 23(22), 9109.
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271. **Albert Theuwissen** : “Throwing a bomb in CIS world : reliability issues with an automotive imager”, Image Sensor Europe Conference, London, March 20-21, 2024.
272. **Accel Abarca and Albert Theuwissen** : “A CMOS Image Sensor Dark Current Compensation Using In-Pixel Temperature Sensors”, Sensors 2023, Special issue on the 2023 International Image Sensor Workshop, 23(22).
273. **Albert Theuwissen** : “From Photons to Bits : Basics of CMOS Image Sensors”, Circuits Insights workshop, ESSERC Bruges, Sept. 9-12, 2024.
274. **Eric. R. Fossum, Nobukazu Teranishi and Albert J.P. Theuwissen** : “Digital Image Evolution and New Frontiers”, The Annual Review of Vision Science, 2024, Vol. 10, pp. 171-198.
275. **Albert Theuwissen** : “Reliability issues of an automotive CMOS image sensor”, AutoSens, Barcelona, October 9-10, 2024.
276. **Albert Theuwissen** : “Recent Developments in the CIS World”, keynote at the InVISIONdays (on-line) Conference, Dec. 3-5, 2024.
277. **Albert Theuwissen** : “Major CMOS Image Sensor Innovations presented at IEDM”, invited paper at the International Electron Device Meeting, San Francisco, Dec. 8-12, 2024.
- 278.

List of Patents :

US :

AUTOFOCUS TELEVISION CAMERA WITH MEANS FOR READING AND COMPARING PARTIAL IMAGES TO DERIVE A FOCUS INDICATION

Theuwissen Albert (Philips)	US4668991	1984-09-14
Izushi Munehisa (Philips)		
Jaspers Cornelis (Philips)		
Van de Steeg Martinus (Philips)		
Vermeulen Arend (Philips)		

CHARGE-COUPLED DEVICE AND CAMERA COMPRISING SUCH A CHARGE-COUPLED DEVICE

Theuwissen Albert (Philips)	US4723168	1985-04-29
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CONTROL METHOD FOR A FRAME TRANSFER SENSOR IN AN IMAGE PICK-UP DEVICE TO OBTAIN BLACK LEVEL INFORMATION IN A PICTURE SIGNAL, AND IMAGE PICK-UP DEVICE SUITABLE FOR USE OF SAID METHOD

Theuwissen Albert (Philips)	US4991016	1987-11-27
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CHARGE-COUPLE DEVICES WITH LOCALLY WIDENED ELECTRODES

Theuwissen Albert (Philips) US5164807 1988-03-15

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WHEREBY PHOTOMASKS COMPRISING PARTIAL PATTERNS ARE PROJECTED ONTO A PHOTORESIST LAYER SO AS TO MERGE INTO ONE ANOTHER

Theuwissen Albert (Philips) US5792591 1993-12-08

CHARGE COUPLED IMAGING DEVICE HAVING AN ADJUSTABLE ASPECT RATIO AND CAMERA PROVIDED WITH SUCH A CHARGE COUPLED IMAGING DEVICE

Gregory Pine (Philips) US5784103 1994-02-17
Brouwer Paul (Philips)
Centen Petrus (Philips)
Stoldt Holger (Philips)
Theuwissen Albert (Philips)

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WHEREBY PHOTOMASKS COMPRISING PARTIAL PATTERNS ARE PROJECTED ONTO A PHOTORESIST LAYER SO AS TO MERGE INTO ONE ANOTHER

Theuwissen Albert (Philips) US5784103 1994-02-17

CMOS IMAGING FACILITY AND A MODULAR ARRAY FOR USE IN SUCH A FACILITY

Theuwissen Albert (DALSA) US2008049131 2006-08-24
US7764315

SINGLE SLOPE ANALOG-TO-DIGITAL CONVERTER

Theuwissen Albert (DALSA) 2006-08-31
Mierop Adrianus (DALSA)
Snoeiij Martijn (Delft Univ. of Technology) US2009195431
Huijsing Johan (Delft Univ. of Technology) US7924207

SHARED PHOTO DIODE IMAGE SENSOR

Mheen Bongki (Korea Electr. Telecom.) US2010133590 2008-12-03
Theuwissen Albert (Delft Univ. of Techn.) US8338868

IMAGE SENSOR BASED DEPTH PIXEL STRUCTURE

Kim Seong-Jin (Samsung) US2012175685 2011-01-07
Han Sang Wook (Samsung) US9076706
Theuwissen Albert (Harvest Imaging)

IMAGER WITH COLUMN READOUT

Theuwissen Albert (Harvest Imaging) US2014183332 2011-12-27
US9040894

DARK CURRENT CORRECTION FOR SHUTTERLESS CAMERAS

Theuwissen Albert (Harvest Imaging) EP2618560 2012-01-18

METHOD FOR CORRECTING IMAGE DATA FROM AN IMAGE SENSOR HAVING IMAGE PIXELS AND NON-IMAGE PIXELS, AND IMAGE SENSOR IMPLEMENTING SAME

Theuwissen Albert (Harvest Imaging) US2013135500 2012-02-06
US8902330

FLOATING DIFFUSION PRE-CHARGE

Theuwissen Albert (Harvest Imaging)	US2013256768 US8853756	2012-04-02
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IMAGE SENSOR AND METHOD FOR POWER EFFICIENT READOUT OF SUB-PICTURE

Theuwissen Albert (Harvest Imaging)	US2013308031	2012-05-16
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IMAGE SENSING APPARATUS FOR SENSING OF DEPTH IMAGE

Kim Seong-Jin (Samsung)		2012-10-30
Theuwissen Albert (Harvest Imaging)	US2014118497	

DIGITAL CAMERA WITH FOCUS DETECTION PIXEL USED FOR LIGHT METERING

Theuwissen Albert (Harvest Imaging)	US2014285685 US9083886	2013-03-22
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IMAGE SENSOR WITH FOCUS-DETECTION PIXEL, AND METHOD FOR READING FOCUS-INFORMATION

Theuwissen Albert (Harvest Imaging)	US2014285706 US9071748	2013-03-22
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IMAGE SENSOR WITH SHADING CORRECTION

Theuwissen Albert (Harvest Imaging)	US2015036029	2013-08-01
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EU :

CHARGE-COUPLE DEVICE

Theuwissen Albert (Philips)	EP0159758	1984-04-24
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AUTOFOCUS TELEVISION CAMERA WITH MEANS FOR READING AND COMPARING PARTIAL IMAGES TO DERIVE A FOCUS INDICATION

Theuwissen Albert (Philips)	EP0182395	1984-09-14
Izushi Munehisa (Philips)		
Jaspers Cornelis (Philips)		
Van de Steeg Martinus (Philips)		
Vermeulen Arend (Philips)		

CHARGE-COUPLED DEVICE AND CAMERA COMPRISING SUCH A CHARGE-COUPLED DEVICE

Theuwissen Albert (Philips)	EP0200270	1985-04-29
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CONTROL METHOD FOR A FRAME TRANSFER SENSOR IN AN IMAGE PICK-UP DEVICE TO OBTAIN BLACK LEVEL INFORMATION IN A PICTURE SIGNAL, AND IMAGE PICK-UP DEVICE SUITABLE FOR USE OF SAID METHOD

Theuwissen Albert (Philips)	EP0323655	1987-11-27
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CHARGE-COUPLE DEVICES WITH LOCALLY WIDENED ELECTRODES

Theuwissen Albert (Philips)	EP0333260	1988-03-15
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DRIVING CLOCK WAVEFORM FOR SOLID-STATE IMAGE SENSORS

Theuwissen Albert (Philips)	EP0364038	1988-10-13
O'Dwyer Brian (Philips)		

MANUFACTURE OF SEMICONDUCTOR DEVICE

Theuwissen Albert (Philips)	EP0657780 JP3898772	1993-12-08
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CHARGE COUPLED IMAGING DEVICE HAVING AN ADJUSTABLE ASPECT RATIO AND CAMERA PROVIDED WITH SUCH A CHARGE COUPLED IMAGING DEVICE

Gregory Pine (Philips)	EP0668691	1994-02-17
Brouwer Paul (Philips)		
Centen Petrus (Philips)		
Stoldt Holger (Philips)		
Theuwissen Albert (Philips)		

SINGLE SLOPE ANALOG-TO-DIGITAL CONVERTER

Theuwissen Albert (DALSA)	EP2060005	2006-08-31
Mierop Adrianus (DALSA)		
Snoeij Martijn (Delft Univ. of Technology)		
Huijsing Johan (Delft Univ. of Technology)		

IMAGER WITH COLUMN READOUT

Theuwissen Albert (Harvest Imaging)	EP2611142	2011-12-27
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DARK CURRENT CORRECTION FOR SHUTTERLESS CAMERAS

Theuwissen Albert (Harvest Imaging)	EP2618560	2012-01-18
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METHOD FOR CORRECTING IMAGE DATA FROM AN IMAGE SENSOR HAVING IMAGE PIXELS AND NON-IMAGE PIXELS, AND IMAGE SENSOR IMPLEMENTING SAME

Theuwissen Albert (Harvest Imaging)	EP2624569	2012-02-06
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FLOATING DIFFUSION PRE-CHARGE

Theuwissen Albert (Harvest Imaging)	EP2648404	2012-04-02
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IMAGE SENSOR AN METHOD FOR POWER EFFICIENT READOUT OF SUB-PICTURE

Theuwissen Albert (Harvest Imaging)	EP2665257	2012-05-16
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DITIGAL CAMERA AND METHOD OF CAPTURING AN IMAGE

Theuwissen Albert (Harvest Imaging)	EP2765765	2013-02-08
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DIGITAL CAMERA WITH FOCUS DETECTION PIXEL USED FOR LIGHT METERING

Theuwissen Albert (Harvest Imaging)	EP2782332	2013-03-22
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IMAGE SENSOR WITH FOCUS-DETECTION PIXEL, AND METHOD FOR READING FOCUS-INFORMATION

Theuwissen Albert (Harvest Imaging)	EP2782331	2013-03-22
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IMAGE SENSOR WITH SHADING DETECTION

Theuwissen Albert (Harvest Imaging)	EP2833621	2013-08-01
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ADAPTIVE NOISE FILTERING

Theuwissen Albert (Harvest Imaging)	EP2860692	2013-10-09
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Others (non-US, non-EU) :

CHARGE-COUPLE DEVICE

Theuwissen Albert (Philips)	NL8401312	1984-04-24
	JPS60242673	
	AU4161185	

AUTOFOCUS TELEVISION CAMERA WITH MEANS FOR READING AND COMPARING PARTIAL IMAGES TO DERIVE A FOCUS INDICATION

Theuwissen Albert (Philips)	NL8501634	1984-09-14
Izushi Munehisa (Philips)	JPS6177815	
Jaspers Cornelis (Philips)	JPH0831979	
Van de Steeg Martinus (Philips)	ES8701447	
Vermeulen Arend (Philips)	CA1249942	
	AU4740385	
	AU583052	

KAMERA FUER DIE FERSEH-, FOTOGRAFIE- ODER FILMAUFNAHME MIT EINER AUTOMATISCHEN SCHAEFEREINSTELLUNGSANORDNUNG

Theuwissen Albert (Philips)	AT53157	1984-09-14
Izushi Munehisa (Philips)		
Jaspers Cornelis (Philips)		
Van de Steeg Martinus (Philips)		
Vermeulen Arend (Philips)		

CHARGE-COUPLED DEVICE

Theuwissen Albert (Philips)	CN85102150	1985-04-01
	CN1006428	

CHARGE-COUPLED DEVICE AND CAMERA COMPRISING SUCH A CHARGE-COUPLED DEVICE

Theuwissen Albert (Philips)	NL8501210	1985-04-29
	JPS61252770	
	JPH0343828	
	ES8800568	
	CA1256200	
	AU5677186	
	AU588588	

LADUNGSGEKOPPELTE ANORDNUNG UND DIES ANORDNUNG UMFASSENDE KAMERA

Theuwissen Albert (Philips)	AT59511	1985-04-29
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CONTROL METHOD FOR A FRAME TRANSFER SENSOR IN AN IMAGE PICK-UP DEVICE TO OBTAIN BLACK LEVEL INFORMATION IN A PICTURE SIGNAL, AND IMAGE PICK-UP DEVICE SUITABLE FOR USE OF SAID METHOD

Theuwissen Albert (Philips)	JPH01251880	1987-11-27
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CHARGE-COUPLE DEVICES WITH LOCALLY WIDENED ELECTRODES

Theuwissen Albert (Philips)	NL8800627	1988-03-15
	DE68923203	
	JPH029138	
	CN1037236	
	CN1027412	

DRIVING CLOCK WAVEFORM FOR SOLID-STATE IMAGE SENSORS

Theuwissen Albert (Philips)	JPH02154579	1988-10-13
O'Dwyer Brian (Philips)		

MANUFACTURE OF SEMICONDUCTOR DEVICE

Theuwissen Albert (Philips)	JPH07272996	1993-12-08
	JP3898772	
	BE1007860	
	DE69410574	

CHARGE COUPLED IMAGING DEVICE HAVING AN ADJUSTABLE ASPECT RATIO AND CAMERA PROVIDED WITH SUCH A CHARGE COUPLED IMAGING DEVICE

Gregory Pine (Philips)	BE1008077	1994-02-17
Brouwer Paul (Philips)	DE69516739	
Centen Petrus (Philips)	JPH07264490	
Stoldt Holger (Philips)	KR100364184	
Theuwissen Albert (Philips)		

SINGLE SLOPE ANALOG-TO-DIGITAL CONVERTER

Theuwissen Albert (DALSA)	CN101512905	2006-08-31
Mierop Adrianus (DALSA)	WO2008026129	
Snoeij Martijn (Delft Univ. of Technology)	JP2010503253	
Huijsing Johan (Delft Univ. of Technology)	JP5181087	

THE SHARED PHOTO DIODE IMAGE SENSOR

Mheen Bongki (Korea Electr. Telecom.)	KR20100063632	2008-12-03
Theuwissen Albert (Delft Univ. of Techn.)	KR101211085	

IMAGE SENSOR BASED DEPTH PIXEL STRUCTURE

Kim Seong-Jin (Samsung)	KR20120080533	2011-01-07
Han Sang Wook (Samsung)		
Theuwissen Albert (Harvest Imaging)		

IMAGER WITH COLUMN READOUT

Theuwissen Albert (Harvest Imaging)	JP2013138432	2011-12-27
	JP5589053	
	CN103281493	

METHOD FOR CORRECTING IMAGE DATA FROM AN IMAGE SENSOR HAVING IMAGE PIXELS AND NON-IMAGE PIXELS, AND IMAGE SENSOR IMPLEMENTING SAME

Theuwissen Albert (Harvest Imaging)	EP2624569	2012-02-06
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IMAGE SENSING APPARATUS FOR SENSING OF DEPTH IMAGE

Kim Seong-Jin (Samsung)	KR20140055025	2012-10-30
Theuwissen Albert (Harvest Imaging)		

DIGITAL CAMERA WITH FOCUS DETECTION PIXEL USED FOR LIGHT METERING

Theuwissen Albert (Harvest Imaging)	JP2014187691	2013-03-22
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