

## 2003 IEEE Workshop on Charge-Coupled Devices and Advanced Image Sensors

### Program

**Thursday May 15th 2003**

8:30	8:50	Opening remarks	Albert Theuwissen	
		<b>Session 1, chair : Bart Dierickx (FillFactory)</b>		
8:50	9:20	A 2e Noise 1.3Megapixel CMOS Sensor	Alex Krymski, Nail Khaliullin, Howard Rhodes	Micron Imaging (USA)
9:20	9:40	Organic Photoconductive Films with Wavelength Selectivities	S. Aihara, Y. Hirano, T. Tajima, K. Tanioka, M. Abe, N. Saito, N. Kamata, D. Terunuma	NHK (Japan)
9:40	10:00	A Multi-Resolution 100 GOPS 4 Gpixels/s Programmable CMOS Image Sensor for Machine Vision	Robert Johansson, Leif Lindgren, Johan Melander, Bjoern Moeller	IVP (Norway)
10:00	10:30	Coffee break		
		<b>Session 2, chair : Nobukazu Teranishi (MEC)</b>		
10:30	10:50	Dark current characterization of the CMOS APS imagers fabricated using a 0.18 um CMOS technology	Hyuck In Kwon, In Man Kang, Byung-Gook Park, Jong Duk Lee, Sang Sik Park	Seoul National University (Korea)
10:50	11:10	A CMOS Image Sensor with Gain-Adaptive Column Amplifiers	Masaki Sakakibara, Shoji Kawahito, Dwi Handoko, Nobuo Nakamura, Hiroki Satoh, Mizuho Higashi, Keiji Mabuchi, Hirofumi Sumi	Shizuoka University (Japan)
11:10	11:25	248-nm UV Damage Mechanism in MPP CCD's	Nixon O., Jonathan Huras, Sukhbir Kullar, Saladin Sahinovic	DALSA (Canada)
11:25	11:40	3-D Optical and Electrical Simulation for CMOS Image Sensors	Hideki Mutoh	Link Research (Japan)
11:40	12:00	Electroluminescence and Impact Ionization in CMOS Active Pixel Sensors	S. Maestre, P. Magnan	SUPAERO (France)
12:00	14:00	Lunch break		

**Session 3, chair : Orly Yadid-Pecht (Ben-Gurion University)**

14:00	14:30	Process and Pixels for High Performance Imager in SOI-CMOS Technology	Xinyu Zheng, Suresh Seshadri, Michael Wood, Chris Wrigley, Bedabrata Pain	JPL (USA)
14:30	14:50	Characterization of Dark Current in CMOS Image Sensors	Hein Otto Folkerts, Joris P.V. Maas, Daniel W.E. Verbugt, Adri J. Mierop, Willem Hoekstra, Natalia V. Loukianova, Edwin Rokhs	Philips Semiconductors (Netherlands)
14:50	15:10	Fabrication of Avalanche Multiplication type CMOS Imager using a-Si:H photodiode film	M. Akiyama, M. Hanada, H. Takao, K. Sawada, M. Ishida	Toyohashi University (Japan)
15:10	15:25	CMOS Image Sensor with Cumulative Cross Section Readout	Ryan Burns, Richard Hornsey	University of Waterloo (Canada)
15:25	15:40	Design Consideration of FPN suppression circuit for a 1.25" 8.3M-pixel digital output CMOS APS	M. Shirakawa, T. Yamashita, K. Mitani, M. Sugawara, I. Takayanagi, J. Nakamura, S. Iversen, J. Moholt, E.R. Fossum	NHK (Japan)

15:40 16:10 Coffee break

**Session 4, chair : Edwin Rokhs (Philips Semiconductors)**

16:10	16:20	Introduction poster session		
16:20	16:24	Programmable sensitivity image sensor with multi-capacitance CMOS pixels	Ryutaro. Oi, Kiyoharu. Aizawa.	University of Tokyo (Japan)
16:24	16:28	Analysis of potentialities of backside-illuminated thinned CMOS imagers	C. Marques-Vatus, P. Magnan	SUPAERO (France)
16:28	16:32	CCD Detection of 157 nm Photons	Flora Li, Nixon O, Arokia Nathan	University of Waterloo (Canada)
16:32	16:36	FAPS: A CMOS Sensors with multiple storage for fast imaging scientific applications	R. Turchetta,	Rutherford Appleton Lab. (UK)
16:36	16:40	Quarter pixel based random access image sensor for wide view imaging	Takayuki Hamamoto, Satoshi Shimizu, Ryusuke Kawahara	Tokyo University of Science (Japan)
16:40	16:44	Temperature dependence of dark current in a CCD	Ralf Widenhorn, Morley M. Blouke, Alexander Weber, Armin Rest, Erik Bodegom	Portland State University (USA)

16:44	16:48	CMOS APS Pixel Photoresponse Prediction for Scalable CMOS Technologies	Igor Shcherback, Alexander Belenky, Orly Yadid-Pecht	Ben-Gurion University (Israel)
16:48	16:52	Backside-hybrid photodetector and image sensor for trans-chip detection of NIR light	Takashi Tokuda, Yoshihisa Sakano, Keiichiro Kagawa, Jun Ohta, Masahiro Nunoshita	Nara Institute (Japan)
16:52	16:56	Image Sensor Architecture for Arbitrarily Directional Motion Detection Using Spatial Propagation Delay of Excitation Signal	Junichi Akita, Misako Takayasu, Hideki Takayasu, Amane Koizumi	Future University Hakodate (Japan)
16:56	17:00	Anomalous annealing behavior of the high resistivity CCD irradiated at cold temperature	G. Prigozhin, M. Bautz, S. Kissel, B. LaMarr, C. Grant	MIT (USA)
17:00	17:04	A High Speed Digital Vision Chip with Multi-grained Parallel Processing Capability	Takashi Komuro, Shingo Kagami, Masatoshi Ishikawa	University of Tokyo (Japan)
17:04	17:08	Charge Sensitive Elements Optimised for Particle Tracking	Grzegorz Deptuch	LEPSI (France)
17:08	17:12	Brain slice imaging. A 100x100 pixel CIS combining 40K frames per second and 14 bit dynamic range	Danny Scheffer, tom Walschap, F. Kubo, M. Ichikawa	FillFactory (Belgium)
17:12	17:16	Source followed noise limitations in CMOS active pixel sensors	K.M. Findlater, D.J. Baxter, R.K. Henderson, J.E.D. Hurwitz, L.A. Grant	STMicroelectronics (UK)
17:16	17:45	Coffee break		
		<b>Session 5, chair :</b>	<b>Eric Fossum (Univ. Southern California)</b>	
17:45	18:45	Discussion Session		
19:00	20:30	Dinner		
20:30	21:30	Poster Viewing		

### Friday May 16th 2003

#### Session 6, chair : Gary Allan (DALSA)

8:30	9:00	Improvement of photo-sensitivity and smear characteristics in a 2.8 um-square pixel IT-CCD image sensor	Tohru Yamada, Hiroshi Tanaka, Ken Henmi, Masato Kobayashi, Horoyuki Mori, Yoshiaki Katoh, Yuji Miyata	Matsushita Electric Co. (Japan)
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9:00	9:20	CMOS Imager with Embedded Analog Early Image processor	Christophe Basset, Pietro Perona, Guang Yang, Bedabrata Pain	Caltech (USA)
9:20	9:40	An Ultra Low Noise High Speed CMOS Linescan Sensor for Scientific and Industrial Applications	Boyd Fowler, Janusz Balicki, Dana How, Steve Mims, John Canfield, Michael Godfrey	Pixel Devices (USA)
9:40	10:00	High Speed Photo Line Sensors	M. Lehmann, M Richter, L. Cavalier, F. Lustenberger, N. Blanc	CSEM (Switzerland)
10:00	10:30	Coffee Break		
<b>Session 7, chair : Dan McGrath (Kodak)</b>				
10:30	10:50	Charge Transfer Noise and Lag in CMOS Active Pixel Sensors	Eric R. Fossum	Univ. Southern California (USA)
10:50	11:10	A 1/2.7 optical format, 3M pixel and progressive scan PIACCD	Hiroo Umetsu, Katsumi Ikeda, Shinji Uya, Noriaki Suzuki, Tetsuo Yamada	FujiFilm Microdevices (Japan)
11:10	11:25	First images with a Medipix2-Silicon detector assembly	M. Campbell, E. Heijne, X. Llopart, L. Tlustos	CERN (Switzerland)
11:25	11:40	Measurement and Analysis of Pixel Geometric and Diffusion MTF Function Components in Photodiode APS Sensors	Tracy Dutton, Jaewon Kang, Terrence Lomheim, Richard Boucher, Ralph Shima, Mark Nelson	Aerospace Corp. (USA)
11:40	12:00	A 35 mm 13.89 Million Pixel CMOS Active Pixel Image Sensor	G. Meynants, B. Dierickx, A. Alaerts, D. Uwaerts, S. Cos	FillFactory (Belgium)
12:00	14:00	Lunch break		
<b>Session 8, chair : Junichi Nakamura (Micron)</b>				
14:00	14:15	Pyramidal Architecture fo CMOS Image Sensor	Faycal Saffih, Richard Hornsey	University of Waterloo (Canada)
14:15	14:30	Demonstration of a frequency-demodulation CMOS image sensor and its improvement of image quality	K. Yamamoto, Y. Oya, K. Kagawa, J. Ohta, M. Nunoshita, K. Watanabe	Nara Institute (Japan)
14:30	14:45	A Wide Dynamic Range CMOS Image Sensor with Integration of Short-Exposure-Time Signals	Masaaki Sasaki, Shoji Kawahito, Mitsuhiro Mase, Yoshiaki Tadokoro	Toyohashi University (Japan)
14:45	15:00	A retinal prosthetic device using a CMOS image sensor employed with modified pulse frequency modulation	J. Ohta, T. Furumiya, David C. Ng, A. Uehara, K. Kagawa, T. Tokuda, M. Nunoshita	Nara Institute (Japan)

15:00	15:15	Empirical Characterization of Lateral Crosstalk for CMOS Image Sensors and Restorative Deblurring Operations	J.S. Lee, J. Shah, R.I. Hornsey	University of Waterloo (Canada)
15:15	15:30	Curved Focal Plane Arrays	April Jewell, Shouleh Nikzad, Toddd jones, David L. Broen, Thomas J. Cunningham	JPL (USA)
15:30	16:00	Coffee Break		
16:00	19:00	Social activity		
19:00	21:00	Banquet + WKA	<b>WKA Chair : Albert Theuwissen (DALSA)</b>	

### Saturday May 17th 2003

#### Session 9, chair : Jed Hurwitz (STMicroelectronics)

8:30	9:00	An 8.2-Megapixel, 10-bit, 60-fps, CMOS APS	Steinar Iversen	Micron Technology (Norway)
9:00	9:20	A High S/N Ratio CMOS Image Sensor with Real Time Object Categorizing Function	Shigetoshi Sugawa, Tomoyasu Tate, Koji Chiba, Koji Kotani, Tadahiro Ohmi	Tohoku University (Japan)
9:20	9:40	Low Power Two-Chip Image Sensor Solution for High-End Sciencitic Applications	Markus Loose, Mark Farris, James Garnett, Donald Hall, Lester Kozlowski	Rockwell Scientific (USA)
9:40	10:00	First break		

#### Session 10, chair : Jerry Hyneczek (ISETEX)

10:00	10:15	A Software-controlled Pixel-level A-D Conversion Method for Digital Vision Chips	Shingo Kagami, Takashi Komuro, Masatoshi Ishikawa	University of Tokyo (Japan)
10:15	10:30	Dynamic Range Enlargement in CMOS Imagers with Buried Photodiode	Vladimir Berezin, Ilia Ovsianikov, Dmitri Jerdev, Richard Tsai	Micron Technology (USA)
10:30	10:45	Design Considerations For large Area Professional DSC CCD Imager Output Amplifiers	C .Draijer, W. Klaassens, H.I. Peek, B.G.M. Dillen, J.T. Bosiers	DALSA (Netherlands)
10:45	11:00	An Image-sensor-based optical receiver fabricated in a standard 0.35 um CMOS technology for mobile applications	Keiichiro Kagawa, Tomoaki Kawakami, Hiroaki Asazu, Tomohiro Nishimura, Jun Ohta, Nunoshita Masahiro, Kunihiro Watanabe	Nara Institute (Japan)
11:00	11:20	Second break		

**Session 11, chair : Yoshi Hagiwara (Sony)**

11:20	12:00	A Two-Dimensional Array Imager Demonstrating Feedback Reset Suppression of kTC Noise	Thomas J. Cunningham, Bruce Hancock, Guang Yang, Monico Ortiz, Chris Wrigley, Suresh Seshadri, Bedabrata Pain	JPL (USA)
12:00	12:20	A low power single chip VGA camera	Laurens Korthout, Parikshit Kumar, Kees van der Sanden, Jan van Geloven, Adrie Mierop, Christophe Kefeder, Olivier Poulmais, Noud Boudewijns, Ton van Keeken	Philips Semiconductors (Netherlands)
12:20	12:40	High Dynamic Range Imaging using Combined Linear-Logarithmic Responses from a CMOS Image Sensor	G.G Storm, J.E.D. Hurwitz, D. Renshaw, K.M. Findlater, R.K. Henderson, M.D. Purcell	University of Edinburgh (UK)
12:40	13:00	Concluding remarks	Albert Theuwissen	
13:00	14:00	Lunch		