Title: **Is The Perfect CMOS Image Sensor Available Today?**
Presenter name: **Albert Theuwissen**
Company name / Institute: Harvest Imaging
Project name: <your related EU innovation project, if any>
Abstract can be published on the website (select): ☒ **YES** ☐ **NO**

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Albert Theuwissen received the degree in electrical engineering and his PhD from the KU Leuven (Belgium) in 1977 and 1983 respectively. In 1983 he joined Philips Research Labs (the Netherlands) and in 2002 he started working for DALSA, first as CTO of the company, later as chief scientist. He issued several patents and he is author or coauthor of 280+ technical papers, including a textbook "Solid-State Imaging with Charge-Coupled Devices". He acted as general chairman of the International Image Sensor Workshop in ’97, ’03, ‘09 and in ’15, and as International Technical Program Chair of the ISSCC2010. From 2001 till 2023, he was part-time professor at the Delft University of Technology, the Netherlands. In 2007 he left DALSA and founded Harvest Imaging. Since then he is fully focusing on training, teaching and consulting in the field of solid-state imaging technology. In the mean time over 300 technical courses, public as well as in-house, are being taught all over the world. In 2011 he received the Electronic Imaging of the Year Award, in 2017 he was elected as the President of the International Image Sensor Society.



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Looking at the performance of a today's CMOS image sensor (quantum efficiency over 80 %, dynamic range over 80 dB, temporal noise below 1 electron, fixed-pattern noise below visibility, parasitic light sensitivity below -100 dB, etc.) one may conclude that the perfection is being reached. Does that mean that no longer new developments can be expected ? In this talk it will be explained that indeed for some characteristics the ideal image sensor is almost in our hands, but this is for sure not true for all performance parameters, even not for all the ones abovementioned. In some cases we are even fooling ourselves, and the perfect image sensor is much further away than we think. For instance quantum efficiency : 80 % only can be reached for black-white devices. In this talk a few performance parameters will be analysed in more details and suggestions will be made for further improvements. The good news : there are still great challenges ahead for the imaging engineers, we are not going to immediately lose our jobs.