

# Usage scenarios for machine learning in industrial imaging - examples of current projects in the food and pharmaceutical industries

*Prof. Dr. Carsten Steger, honorary professor  
at TU München and Director Research at MVTec Software GmbH*

**Location:**

automatica Forum  
hall A5, stand 135

**Day and time**

Thursday, 21st June 2018  
1:00 – 1:30 p.m.

Machine learning is the process of using algorithms to collect data, draw conclusions from them, and subsequently make predictions based on these learnings. Thus, rather than relying on handcrafted software routines, the machine learns to perform its task from large datasets. Due to its tremendous potential, machine learning continues to gain traction across industries.

This presentation will focus on deep learning, a subset of machine learning, and how it can be used for machine vision. Attendees will learn how CNNs (Convolutional Neural Networks) can be trained by providing a sufficient amount of labeled training images. During training, the vision software will then analyze the images and automatically learn which features can be used to classify samples. This is a big advantage compared to previous classification methods, where these features had to be handcrafted by the user – a complex and cumbersome task that requires skilled engineers with programming and machine vision knowledge.

To show the different usage scenarios for this kind of classifiers, the presentation will show examples from current projects in the food and pharmaceutical industries as well as from other industries. MVTec Software GmbH is currently working with various companies on applying deep-learning-based solutions to vision tasks. The presentation will give attendees a good overview of what is currently possible in the field and how complex vision tasks can be tackled in an industrial setting.

## Speaker

Prof. Dr. Carsten Steger, MVTec Software GmbH

- 1993           Diplom-Informatiker (MSc in Computer Science), Technical University of Munich (TUM)
- 1996 to date   co-founder, co-owner, General Manager (Prokurist), and Director Research at MVTec Software GmbH
- 1998           PhD from the Department of Informatics at TUM
- 1996 to 2000   Secretary of the Working Group III/4 “Image Understanding / Object Recognition” of the International Society for Photogrammetry and Remote Sensing (ISPRS).
- 2000 to 2004   Chairman of the Working Group III/5 “Algorithms for Industrial Vision” (2000–2004) of the International Society for Photogrammetry and Remote Sensing (ISPRS)
- Since 2011     Honorary Professor for the field of image understanding and machine vision at the Department of Informatics at TUM

Since 2013, he has been a member of the Technical Committee of the German Association for Pattern Recognition (DAGM)

Several scientific awards for his work, e.g., in 2000, the Talbert Abrams Grand Award from the American Society for Photogrammetry and Remote Sensing

## About MVTec Software GmbH

**MVTec Software GmbH** is a leading international manufacturer of software for machine vision used in all demanding areas of imaging like the semiconductor industry, inspection, optical quality control, metrology, medicine or surveillance. In particular, software by MVTec enables new automation solutions in settings of the Industrial Internet of Things.

MVTec is the developer and vendor of the general purpose machine vision software products HALCON and MERLIC. Furthermore, MVTec builds customized software solutions for machine vision – from consultancy, studies, and prototypes up to integrated products. Software solutions can be based on standard PC or embedded hardware (e.g. ARM®-based systems). To offer customers the greatest possible benefit, MVTec’s innovative work is driven by a commitment to be the number one supplier for all kinds of machine vision software technologies.