# Curriculum Vitae

Jan Cornelus Albert Dekkers was born on August 5, 1975 in Flushing (Vlissingen), The Netherlands. From 1991 until 1995 he studied Electrical Engineering at the Zeeland College in Middelburg. He subsequently studied Electrical Engineering at the Technical College in Flushing at HZ University of Applied Sciences (Hogeschool Zeeland or HZ for short). His practical trainee for the HZ was with Stichting Omroep Zeeland, The Netherlands. From 1998 until 1999 he was part-time lecturer in the field of power electronics at the HZ faculty of marine. His graduation project for the HZ was with Uitgeverij Audio Pers Nederland Rotterdam, The Netherlands. The subject concerned circuit design and prototype realization for a high-end audio power amplifier using tube technology for implementation. In July 1999, he gained his Bachelor of Electrical Engineering degree ("ing." for short in Dutch) after defending his thesis titled "Het ontwerp van een triodeversterker".

In August 1999 J.C.A. Dekkers started as research engineer in the field of integrated transceivers at Philips Research Laboratories, Eindhoven. In this position he worked on analog integrated microwave key building-blocks for UMTS mobile and satellite bipolar front-ends. In particular, low noise amplifiers (LNA) and mixers were subject of investigation in the frequency range from 2 GHz to 13 GHz. He obtained a patent publication for a novel LNA architecture, which can be found as US7135923 B2 (WO03085821 A1). However, he specialized himself in noise calculations for chain connection of two-port and/or multi-port networks.

From September 2001 until 2006, J.C.A. Dekkers studies part-time Electrical Engineering at the Technical University of Eindhoven, The Netherlands. He completed this study for 75 percent and was stopped for practical and personal reasons. He is intended to finish the study as soon as he is in the position to do so.

In 2005 he co-authored a paper at the ICCE Conference called "Low-cost Silicon-Germanium IC's for digital satellite outdoor units". In 2006 he was transferred to NXP Semiconductors Eindhoven where he worked as research scientist in the field of integrated RF solutions. In this position he worked on CMOS LNA and tunable filters for DVB-T/H/S2 and ATSC standards. He co-authored in 2007 a patent publication for radio frequency power amplifier baseband signal predistortion where he worked on the mathematical background and provided VerilogA simulation models. This publication can be found as US7999587 B2 (WO2008084419 A3) and was US granted in 2011.

In December 2007 J.C.A. Dekkers left NXP for career planning reasons and started as R&D engineer at Skalar Analytical BV, Breda. In this position he got familiar with the design considerations of automated chemistry analyzers for laboratories. He studied the use of a photomultiplier tube (or PMT for short) to measure nitric oxide and/or ozone concentrations based on a chemoluminescent reaction. To optimize the choice of the tube he developped a mathematical model to predict the signal-to-noise ratio of the signal prior to digitizing. This model concerned current gain transfer parametrization, dark current estimation and (secondary emission) shot noise contribution as function of applied voltage and photocathode temperature. The results provided a well educated guess in predicting the lower detection limit of the nitrogen detector.

During his time at Skalar, he got involved in the design of cost effective stepper motor drivers where the noise of the system was an important specification. He found out that driving a stepper motor with a pure sinusoidal current the noise produced by the motor reduces dramatically. J.C.A. Dekkers proved this by means of a discrete power amplifier comprised of a complementary long tailed pair and a classic class AB power stage. To reduce noise in the often used switched H-bridge topology, he found out that a proper pcb layout is essential. To measure the current in the stepper motor coils he explored a novel current instrumentation amplifier topology. The current waveform is often an indicator of produced noise in a stepper motor. At this moment J.C.A. Dekkers is investigating the use of a sigma-delta modulator in microcontroller to reduce cost and unwanted noise even more.

J.C.A. Dekkers succesfully replaced (high voltage) synchronous AC motor and VI controlled DC motor solutions in continuous/segmented flow analyzers (CFA/SFA) by stepper motors controlled by a PIC microcontroller where a constant rotational speed is essential for accurate analyzer results.

The linear and rotational movements to be driven by (stepper) motors became also his field of expertise. In particular, the dynamics of starting and stopping of mechanical systems such as belt-and-pulley and lead screw systems were subject of investigation. He derived a mathematical model for those systems and he focussed on the impact of the speed profile of the movement with respect to the required torque of the driving (stepper) motor. He proved that a hyperbolic tangent (tanh()) speed profile reduces dynamic problems in rotational systems compared to solutions utilizing a triangular or a trapezoidal speed profile.

In the role of EMC engineer he conducted several measurements to pre certify the chemistry analyzers at Skalar. Conductive and radiated Class B emission measurements were performed by J.C.A. Dekkers.

Currently, he is working as a senior design engineer on a discrete analyzer for chemical laboratories. In this position as system architect he is responsible for the intrinsic qualities of the machine. Optical irregularaties, mechanical rotational position repeatability, electrical noise, jitter performance of the clock driving the ADC and chemical sensitivity are subjects to consider. Thermodynamic principles such as heating measurement samples (to speed up the chemical process of (de)colorization) and cooling down of reagents/enzymes are also important to take into account.

Last but not least, J.C.A. Dekkers got married in 2013 to the woman he left 21 years before and became stepfather to a wonderful boy.