EIGHT NOMINATIONS FOR 2020 WIM VAN DER HOEK AWARD

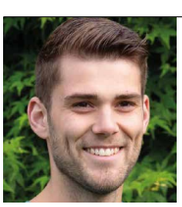
Mechanical design based on the design principles defined by Wim van der Hoek is very much alive. The Philips engineer and part-time professor at Eindhoven University of Technology passed away early last year at the age of 94, but his name lives on in the prize named after him and his ideas are still taught. The nominations for the Wim van der Hoek Award 2020 testify to this. The jury received a total of eight nominations from two universities of technology and two universities of applied sciences for students who applied existing or new construction principles in their graduation work. The award presentation, originally planned at the 2020 Precision Fair (cancelled), will take place at an alternative (online) occasion, under the auspices of DSPE.

Candidates

Jelle Elenbaas
(Fontys Engineering University of Applied Sciences)

Design of a multiple LED ring light for inspect positions of ADAT3-XF using AM

"Jelle has made an original design for an LED lighting ring that has to be able to take up two positions on Nexperia's ADAT3-XF die-bonder based on a bistable ('click clack') mechanism that should be realised by means of additive manufacturing (3D printing). Jelle shows excellent commitment, is flexible, takes initiative and is also critical of his own work (he reflects well). The value of Jelle's design for Nexperia is enormous. If the design meets expectations (the prototype has yet to be built), the result will be more functionality for a quarter of the current price."



Marijn van Houtum
(Fontys Engineering University of Applied Sciences)

Design of a positioning stage for Cryo samples

"Marijn is a very passionate, efficient and result-oriented designer. He also has sufficient self-confidence and is not afraid to ask questions. Despite the limitations of the corona crisis, he managed to make a design for Frencken Engineering within the set cost budget. This involved a complex positioning stage for cryogenic samples for an electron microscope. The result is a complete mechanical precision design, which includes all relevant sub-aspects (including design principles, choice of materials, error and cost budgeting, and technical product documentation including shape and position tolerances). In addition, the design was realised and assembled during the graduation period. Marijn shows excellent constructive insight with an eye for both theory and practice."

Joris Lammers
(Fontys Engineering University of Applied Sciences)

Het ontwerpen, optimaliseren en valideren van een 3D metaal geprint kruisveerscharnier
(Designing, optimising and validating a 3D metal printed cross-spring hinge)

"During his graduation project at MTA, Joris devoted himself fully to the design of a 3D metal-printed cross-spring hinge with a large stroke and high lateral stiffness. He iteratively went through the process of printing, testing behaviour, making improvements and printing a new design. He alternated his pragmatic approach with sifting through demanding papers in order to understand the theory and include it in his analyses. Joris has taken on the challenge of printing very thin metal structures, among other things. He investigated which materials, printer settings and post-processing treatments are most suitable for this. 'That design is so logical, it must already exist', one might think when one sees the end result. Apparently, it wasn't that simple after all, because the design didn't exist yet. MTA has now obtained a patent on it."

Bram Lomans
(Eindhoven University of Technology)

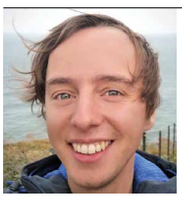
Mechatronic Architecture and Design for a Metrology Tool with Parallel Sensors

"Bram has been working on a new concept for small parallel sensors for application in future ASML Yieldstar metrology systems. He is very independent and goal-oriented. His graduation project was part of a broader study within ASML Research. During his graduation he was one of the few mechanics who held his own very well in a team mainly comprising opticians. He maps out his own route and knows how to include his environment. Bram is creative and analytically strong, and has good communication skills. To increase his 'bandwidth', he successfully supervised a bachelor's final assignment. He is a mechanical engineer in a broad sense with a focus on precision mechanics, both conceptually and on a detailed level."

Jochem Lutgerink
(Delft University of Technology)

Design and Validation of a Collimator Alignment Assembly for a High-Power Bulk Multiplexer used in Ground-to-GEO Laser Communication

"Jochem graduated on the subject of satellite communication with light. His assignment at TNO was to design a compact, stable and high-precision alignment of the five lasers with different colours that form a high-power light source in the ground station. An assignment in which he could demonstrate his strengths: analytical skills, coupled with a critical attitude and confidence in his own skills, besides a thorough knowledge of optics as well as opto-mechatronics. He has developed a new alignment mechanism, using the well-known design principles and taking into account the requirements for (thermal) stability. In an original manner, he has combined 3D metal printing with the classic opto-mechanical alignment technology. He has also realised the mechanism and designed an optical measurement set-up for testing. During his graduation project, Jochem has grown in terms of knowledge and as a person, from a cautious techie to a budding system designer with confidence and pleasure in his profession and the drive to promote this profession."



Kas van Roekel
(Avans University of Applied Sciences)

Ibis Nest

"Kas has a broad interest in technology and his enthusiasm is very contagious. He is co-founder of the student start-up Stuval, a multidisciplinary development company that connects young talent with companies and develops ideas. Within Stuval he focuses on the application of Triz, the well-known method for inventive problem solving. Kas was looking for a graduation assignment with construction principles in the lead. At Settels he found a challenging question with complex boundary conditions. The final solution is elegant, because it is simple and well thought-out. He tries to keep the writing of reports to the minimum necessary, especially because he believes that you get to the essence of a problem faster if you experiment with 3D-printed models. He has shown that he has the potential to develop into a real engineer-designer."

Teun van der Sande
(Eindhoven University of Technology)

Design of a Retractable Imaging Device

"Teun showed his competences by tackling in-depth mechanical design issues while maintaining a clear overview at system level. During his assignment at Prodrive Technologies, he started with a system decomposition resulting in two major design issues to solve. In the first place, the design of a non-overdetermined support of the fragile sensor including its strict requirements on cooling. Secondly, the design of a linear-guidance-based retraction mechanism with a well-defined pretension and without end-of-stroke collision forces. Teun's analytical and experimental skills, enthusiasm and eagerness to learn, together with the ability to transfer newly obtained knowledge in a structured manner to team members, allowed him to solve both issues and to create a fully integrated product design as well."

Stan Smolders
(Fontys Engineering University of Applied Sciences)

Mitigation of disturbances on a linear stage, using FeedForward and Iterative Learning Control

"Stan is a social, attentive and passionate person. During his study he was always prepared to provide explanations to others and in this way he helped so many students. His analytical level far exceeds the level that can be expected of an HBO bachelor student. He has taken on a complex challenge during his graduation at MI-Partners: applying advanced, data-based ILC (Iterative Learning Control) solutions to a high-precision positioning system to reduce repetitive errors, while also seeking – based on system knowledge – basic functions for reducing, in conjunction with ILC, the tracking error in a more robust manner (with changing input signals). He compared all this with the traditional model-based feedforward control. Stan managed to master the necessary theory under challenging circumstances (a lot of working from home because of Covid-19)."