Computer generated car design

Steps to a creative system by Lennert Bontinck

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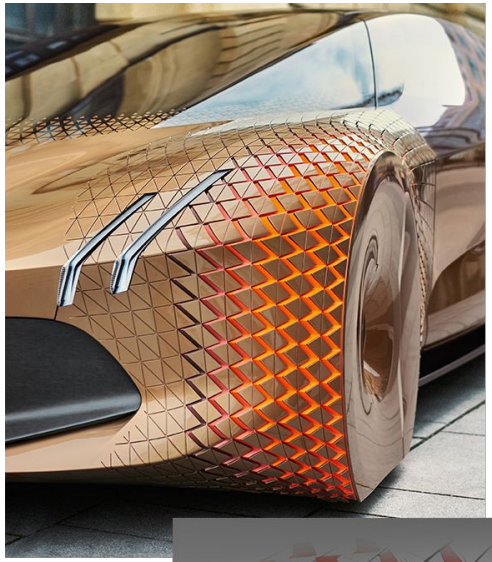
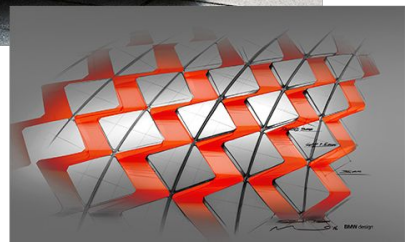
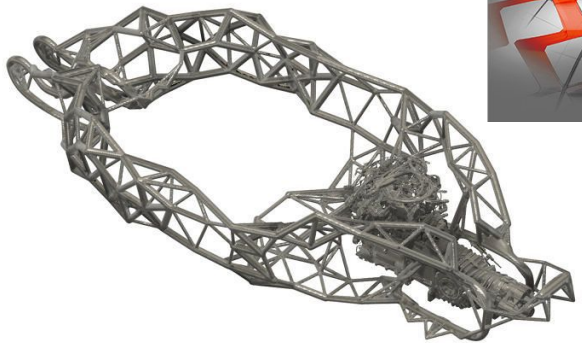
Why choose this domain

- I’m a nerd and car geek
- Get an idea of merged brand design
- Access to multiple juries
- Fascinating past work
- Interest by big brands
- It’s just cool







Pette, B. (2016). *The world’s first ai-generated car*. Retrieved February 17, 2021, from https://blogs.nvidia.com/blog/2016/07/26/hack-rod-car-ai/
BMW. (2016). *The fascination of AI design*. Retrieved February 14, 2021, from https://www.bmw.com/en/design/ai-design-and-digital-art.html

Interesting work

Real life applications

- Hackrod (Pette, 2015)
- Czinger(Girish, 2020)

Image generation

- StyleGAN (Karras et al, 2018)
- Predicting cybertruck design (Trevedi, 2019)
- Automating Car Design Studio with GAN (Radhakrishnan et al, 2020)

GAN control

- Understanding hidden units in deep NN (Bau et al, 2020)
- GANSpace (Härkönen et al, 2020)

Pette, B. (2016). *The world's first ai-generated car*. Retrieved February 17, 2021, from https://blogs.nvidia.com/blog/2016/07/26/hack-rod-car-ai/
Girish. (2020). *A revolutionary hypercar built for the 21st century*. Retrieved February 17, 2021, from https://www.czinger.com/about-21-c
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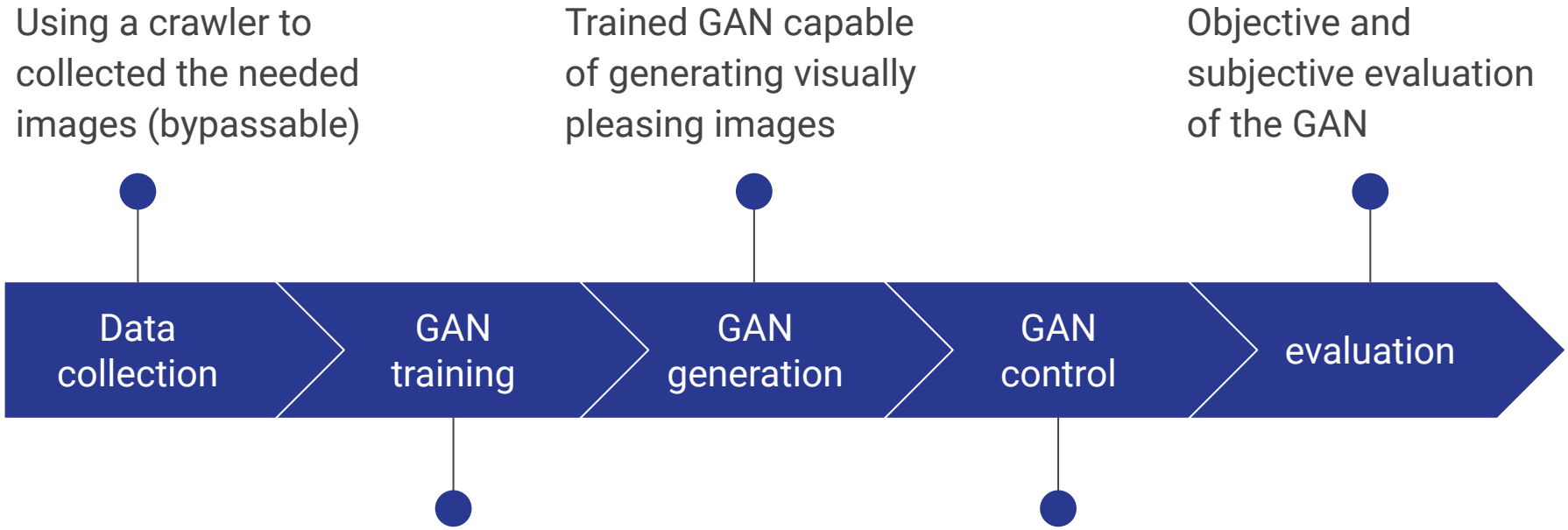
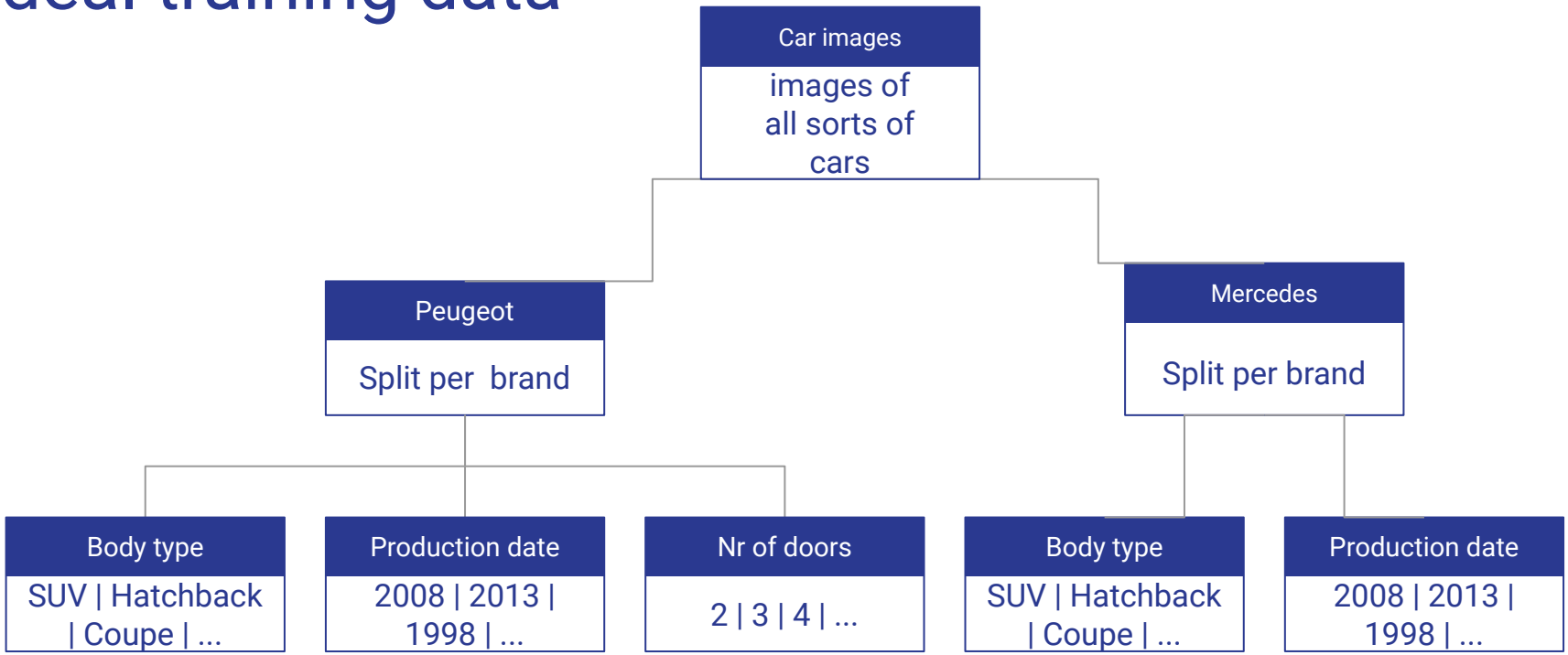
Trivedi, C. (2019). *Fun with stylegan: Let's predict the tesla cybertruck design!* Retrieved February 17, 2021, from https://bit.ly/2QNL9wL
Radhakrishnan, S., Bharadwaj, V., Manjunath, V., & Srinath, R. (2018). Creative intelligence -automating car design studio with generative adversarial networks (gan). In A. Holzinger,P. Kieseberg, A. M. Tjoa, & E. Weippl (Eds.),*Machine learning and knowledge extraction*(pp. 160–175). Springer International Publishing.
Bau, D., Zhu, J.-Y., Strobelt, H., Lapedriza, A., Zhou, B., & Torralba, A. (2020). Understanding the role of individual units in a deep neural network.Proceedings of the National Academy of Sciences,117(48), 30071–30078. https://doi.org/10.1073/pnas.1907375117
Harkonen, E., Hertzmann, A., Lehtinen, J., & Paris, S. (2020). Ganspace: Discovering inter-pretable gan controls.

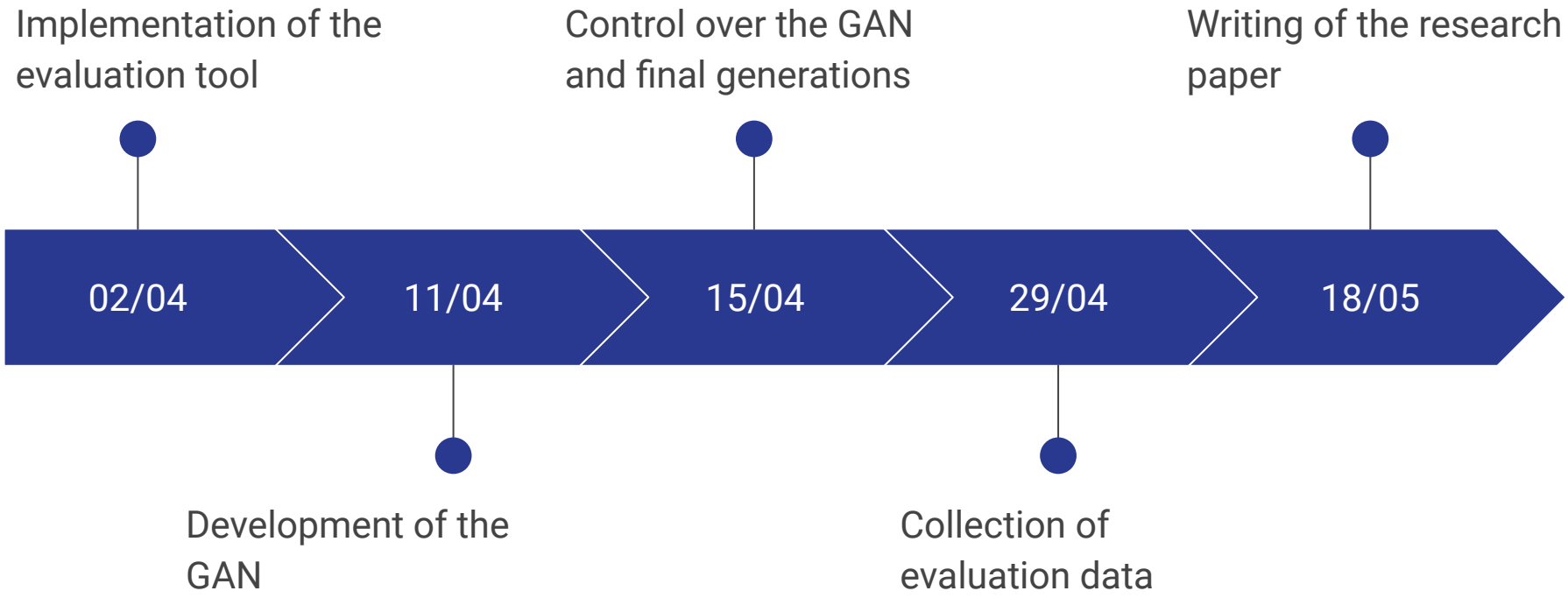
Flow of the system



Ideal training data



Proposed roadmap



Evaluation

- Using seen crateria
- Access to expertised juries
- Reusing previously written evaluation tool

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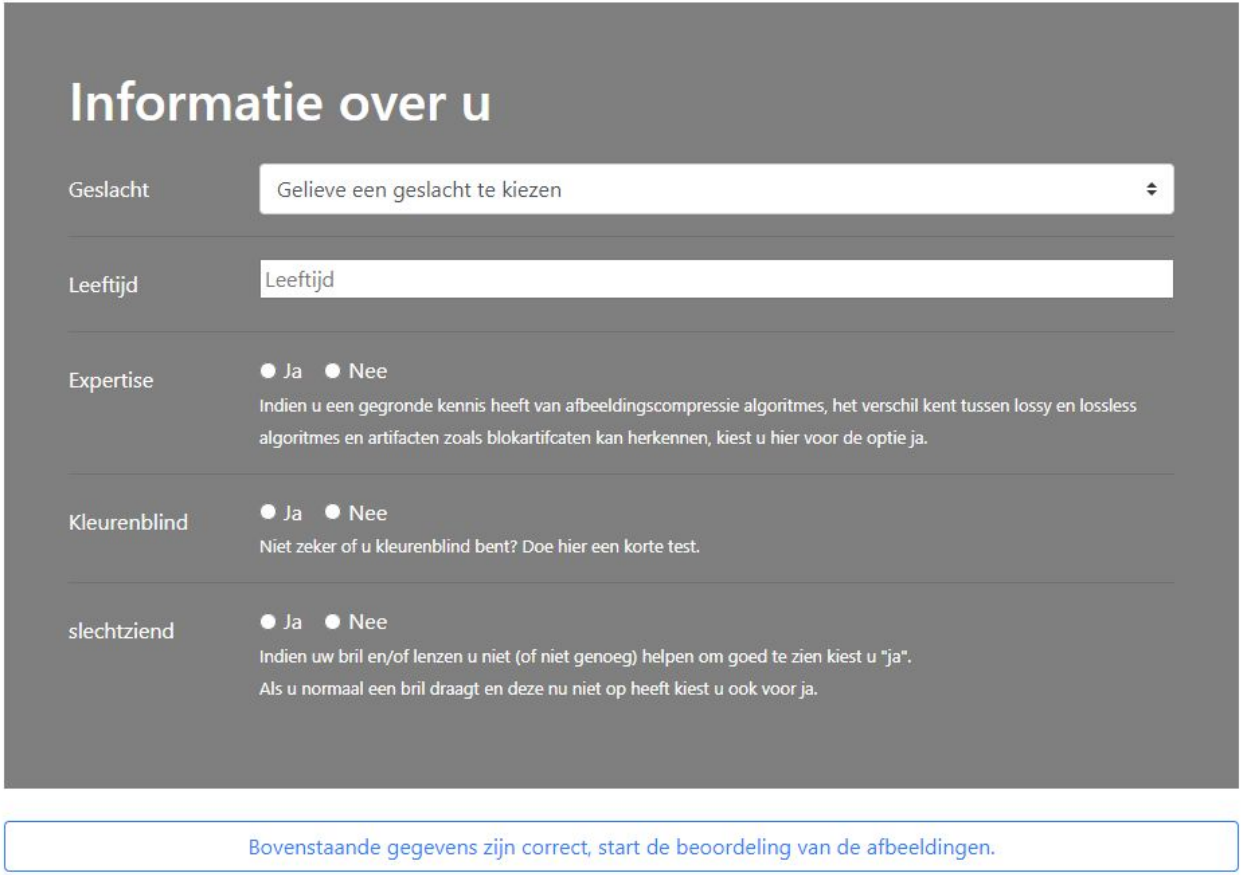

Questions?

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