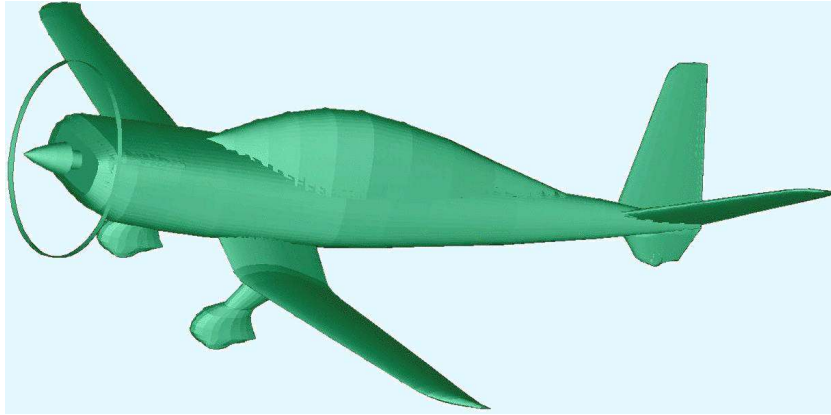


RDS^{win} meets AI -a short memoir by Dr. Daniel P. Raymer

My RDS^{win} aircraft design software has a fairly simple routine for rendering perspective illustrations. The perspective math is perfect, but the rendering is done simply by creating tens of thousands of little triangles, using the vector cross-product to determine how directly they point to the observer, shading them accordingly, then drawing them all starting with the ones farthest away from the observer. The results look like this. It's better than a wireframe, and good enough to show your design concept to others, but it's not exactly "photo realistic."

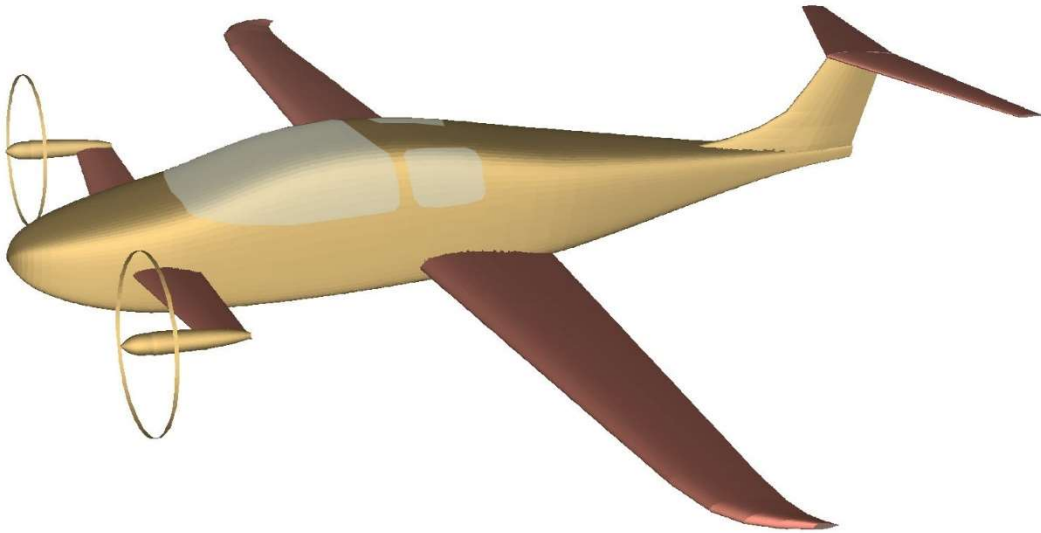


One of my excellent brothers recently wrote an essay about his use of Artificial Intelligence in quantum physics research, which I posted on LinkedIn. This got me to thinking, what about using AI to make realistic renderings of my aircraft designs? Another excellent brother has a Masters Degree in Broadcast Communication and a successful career in technical photography and marketing. He has been exploring AI for several years now, so I asked him to take that RDS^{win} design and turn it into a rendering. Here is the result:



Wow! My brother had to talk ChatGPT thorough several iterations to get the white paint and gorgeous strip design. It looks amazing, but what happened to the ventral fin holding the tailwheel? What happened to the gull wing? Why is the main landing gear back where it would be for a tricycle gear aircraft, and not where it belongs for a taildragger? Still, wow!

After some guidance from my brother, I tried it myself. I made a new design in RDS^{win}, did this render, and used photo software to show the canopy. I gave it to ChatGPT and said “make a realistic image of this electric powered four seat airplane flying over Stockholm.” The initial result is below.



Amazing! On first glance. If you know Sweden (I'm there right now), you see some Stockholm-ish features, but it isn't right. The waterways resemble those around Stockholm, but really

aren't. There are two copies of the famous Statehouse building where Nobel Prizes and PhDs are awarded (including mine). The people who live in nearby apartments will be surprised to find that they are now under water. Etc...

The airplane looks pretty good, but there are six or more seats, strangely staggered. So I typed, "great! put only four seats inside with people in the front two seats." Yes, I know it really isn't alive but a little praise never hurt anybody.

ChatGPT fixed that, so I said, "put black and silver stripes on fuselage only, and registration number NOWAY on tail." That was good but the stripe was straight and ugly so I said, "make that stripe slightly curved from front to back, downwards at first then up and over wing, then slightly down behind wing."



Good job, Chatty! Now I know that I can use AI to make beautiful renderings of my latest designs. My design project customers will love it.

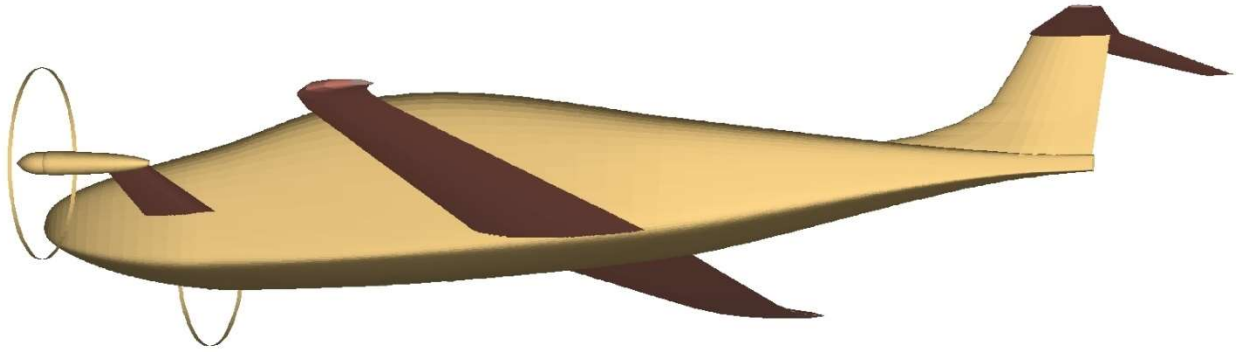
Next, I decided to ask it something more difficult: "Very nice work! Now show it from below, taking off from Arlanda airport, with flaps and landing gear extended."



Oops. That ain't right. Wing is in the wrong place, and that propeller is too far out. At least the airport looks a little like Stockholm's Arlanda, and helpfully has that written in giant letters. Next attempt: "move the wing towards the tail by one sixth the length of the fuselage."



Even worse. I decided to offer help with the perspective transformation. I provided a fresh RDS^{win} image from that angle and said, "use this image to fix the airplane on your last image."



Now I don't know whether to laugh, cry, or throw my Windows laptop out the window. I tried a few more things but it kept getting worse.

I gave up, and typed, "I've learned that AI does a poor job of rotating three dimensional objects in space. That is a common feature of human IQ tests. Comments?"

Its reply:



Even M C Escher wouldn't understand the perspective on that one.

I have learned that AI can quickly make amazing images from RDS^{win} renderings. Just don't ask AI to show too much "I".

Daniel P. Raymer

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