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To whom it may concern,

Axel Schumacher worked for me as lead firmware engineer at Martian Robots in 2016.

As a small startup, we required a team of self-starters. Even in our high performance team Axel stood out for his attention to detail and his can-do attitude. He did such a good job on the firmware that I had planned to move him to other parts of the system so that some of his practices would rub off on our other developers.

Our system includes a network of small microcontrollers that share the load for sensing and the control system, responding to high-level commands given by a separate processor running artificial intelligence algorithms. Axel was responsible for the entire microcontroller system, including selecting the microcontrollers, developing the communications protocol, building the hardware prototype, and making all the technical decisions for the execution. Axel did a superb job on this system. This was a challenging task, as the system is required to be extremely high performance but low cost. He implemented the entire system as bare-metal firmware, as well as the Linux driver that interfaces with the rest of the system. He also developed a hardware test-bed and simulator that facilitated testing and qualification of our system.

Axel also has great technical leadership. He was key in creating and advancing our practices relative to our code repository, and he also was one of the key people who defined the architecture of the entire system.

He is an excellent debugger – he is as comfortable with an oscilloscope as with the GDB debugger. Axel embodies the best qualities in a strong engineer – excellent programming skills, strong technical leadership skills, and a willingness and desire to help and work with others.

If you have any questions about Axel feel free to call me at 650 796 1966 or email me at [joe@augenbraun.com](mailto:joe@augenbraun.com).

Best regards,



Joe Augenbraun  
CEO, Martian Robots