Martian Robots

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Martian Robots
390 Vassar Ave,
Berkeley, CA 94708

To Whom it May Concern,

I am the CTO/Founder for Martian Robots, and Axel Schumacher reported to and closely interacted with me at Martian. He is among the top two out of my ten+ developers (the top two work on such different things, I cannot really compare them).

He has strengths across the board as a developer, and as a firmware developer in particular. I won't say more about each of these expected areas; instead I will focus on areas where I found him to be extraordinary: Our startup is developing the hardware and software for a one-armed mobile robot. With such a large scope, I had little time to devote to the specifics of our firmware layer. Axel took it upon himself from is first day on the job to develop what came to be our cleanest, best tested, most stable/general part of our code base.

He made many choices that time has borne out as quite auspicious. He stared with a basic network protocol that allowed us to abstract the specifics of our actuation/sensing interconnects as a set of "time-synchronized I/O channels." This allows his code base to remain stable as we rapidly shifted physical designs. He expanded this to multi-processor bus protocol that allowed us to retain his simple abstraction, and ALSO begin using a network of embedded processors (this was key for reducing CPU overload and wiring in our complex bot). At his own initiation and design, he developed a pretty ingenious testing protocol where he reused much of his code to build simulated sensors and actuators using additional embedded processors. This allows us to test our entire end-to-end multi-processor configuration, while systematically pretending that a sensor or effector is failing, dropping data, etc. I am unaware of that level of end-to-end testing being automated in this way – it certainly does not happen at this level in the startup world!

What was most gratifying about each of these innovations: Axel would quietly plug along, and would then propose one of these innovations along with a timeframe for implementation. Each one dovetailed with our ongoing development effort in a way that added value, and minimized disruption to APIs etc. Internally, his code is also quite clean. On his own initiative, he refactored his code when we moved to a multi-processor bus architecture, so that the parsers needed for half and full duplex communication shared as much code as possible, while still remaining fully performant. He also organized his code so that we could use a single code base for all embedded processors. All the specifics for sensors, actuators, and network topology were specified as compile-time configuration files. Again this technique (entirely of his design) was instrumental in allowing our system to quickly evolve.

Axel will make a strong addition to any team he joins.

Best Regards,

Daniel Oblinger
Founder/CTO Martian Robots