



The Six Rules for Applying Machine Vision

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We want to thank you for taking the time to review this article produced by the team at RR Floody. We realize that your time is valuable, and we hope this document provides you with relevant content. At RR Floody, one of our primary responsibilities is educating our customers on good machine vision practices. To make the machine vision world a better place, we have taken it upon ourselves to publish some common principles and lessons learned in a series of periodic newsletters. All of our RR Floody sales engineers have a copy of the newsletters, so if you miss one, or need to refer back to a previous one, don't worry, we have you covered!

This newsletter's topic starts right where we think any vision engineer should begin, with our six rules for applying machine vision. Whether new to the field, or a seasoned vision engineer, application of these principles will put your vision project on the road to success. These six principles are adapted from a class taught periodically by our Vice President, Michael Hahn.

Rule #1. Good data in, equals good data out . . . Every new vision application at RR Floody is kicked-off with our documented application evaluation process. If RR Floody is a new company to you, then you may not be aware of our motto, "Our process and partnership drive success." We feel that our process is one of our most defining factors. With successful machine vision implementation, it is necessary to acquire a solid understanding of the products to be inspected and defects to be rejected. Having the best data at the commencement of any vision application will always yield the best opportunity for success. Obtaining good data often requires strict discipline. As you know, in the production environment, defects can vary widely. Anyone can have success in identifying major defects, but the minor ones often require inspection tools to be tested on hundreds, or even thousands of images. There is a very fine line between catching necessary minor defects and falsely rejecting acceptable product.

Our best advice is to make certain that you and/or your vision vendor is taking the extra time necessary to acquire good information up front. Additionally, a thorough study of the product matrix that will pass through a vision system is necessary. Take time to comb for what we label "gotch-ya's." A common one that we see is large products in-line with small products, which open up the field of view, decreasing resolution available for detailed inspections.

Rule #2. Make certain you are programming from a "Golden Image". . . It is imperative that a vision system is programmed using a "golden image". Often during production line startups, product measurements can vary as products are brought up to constant operating temperature. Make certain you take the time to verify that your trained product is actually within your identified specifications. Failure to complete this rule will diminish consistency in quality.

Rule #3. Accurately name your inspection tools and machine vision components. . . Most tools receive names by default. Additionally, if you copy a tool over it may only receive an additional numerical suffix to differentiate it from the original tool. This can create challenges as detailed inspections requiring a number of tools can quickly become confusing. Even the simplest changes can make a big

difference. Let me provide an example for reference. Awhile back, one of our customers implemented a name change for some of their inspection cameras. They went from “Front Label Camera” and “Back Label Camera” to simply “Front Camera” and “Back Camera”. This became necessary, as they saw a growing trend where the “Front Camera” would see both front labels and back labels.

Accurately naming tools and components of machine vision can also be very important for support or transfer of project ownership to other team members. Typically, no one has the capacity to be the only individual with the knowledge of how to support a complex vision system.

Rule #4 Check your work . . . Read that statement again . . . This rule circles back to good data in, equals good data out. You always want to make certain you are taking your time in machine vision implementation. Make certain you have all your preliminary information correct. You can think of a machine vision application somewhat like building a home. Would you have a desire to live in a house that was never inspected at its vital stages (framing, electrical, plumbing, etc.)? You would be living in a ticking time bomb, just waiting for something to go wrong. Please don’t make your vision application a ticking time bomb. Your time invested upfront to review your work will pay dividends down the road. Set a goal for yourself to scan through a log of images when you implement new tools. Make certain you have defect samples and they are failing when they are supposed to. I always breathe a sigh of relief when I walk into a customer’s plant and see file cabinets, or even a room full, of defect samples. You know who you are . . . Thank you!

Rule #5 When in doubt, consult an expert (We hope RR Floody!) . . . If you get into trouble on any vision application it is important to have an expert to consult who is just a phone call or email away. We certainly hope that your expert is RR Floody! Our team boasts over 65 years of combined vision system experience, and we pride ourselves on our partnerships with our customers. Often times just having another expert within your organization to bounce ideas off will be sufficient. We also encourage our customers to limit their time spent on troubleshooting issues. I cannot tell you how many times I have seen a customer struggle for hours and then finally decide to contact our engineers, only to have an experienced engineer resolve the dilemma in minutes. Also, when you contact an expert, make certain that you devote time to work with them and they devote time to train you, especially on paid services calls! Make sure you get your money’s worth!

Rule #6 No Fear! . . . This may seem somewhat contradictive to the statement above, but we do encourage all vision system engineers, expert or novice, to push themselves outside of their comfort zone. This is the way they will grow in their overall capabilities.

We hope this article served you well. It may be beneficial to just write down the six rules and post them at your desk or keep them at hand in a desk drawer. We welcome your comments and feedback. Stay tuned for our next educational newsletter!