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| **Company Info** | | **Technical POC** | |
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| **N2N System Description** | | | |
| Title:self/machinist | | □ Software Solution (uses conventional sensor)  X□ Hardware/SW Solution (custom hardware and software) | |

**IARPA Nail-to-Nail Challenge Registration**

All Stage 1 Registrations need to be submitted to Challenge.gov by **March 17, 2017**

Abstract

*At a high level, what do you propose to do?* Abstract: The FingerPrinter is based off of a common laserjet printer. When the fingerprinting proccess is innitated the paper is fed from the que to a specific point where a laser limit switch stops the feeding of the paper when the paper breaks the laser beam. At that point the subject is propted by an instructional video on a dedicated tablet to roll their finger on an ink pad, and then to enter it into a hole. After the subject pushes the alluminated green light that they are propted to push by the instructional video, 2 sets of stepper motors feed the paper in opposite directions, tightening it around the finger. When 2 mechanical limit switches are engaged the machine will proceed to the the next step of reversing and loosening the paper from the subjects finger. The paper will then feed forward a predetermined length as to allow for the process to repeat for the remaining fingers. The machine will operate on a simple G and M code program, which is common for machines using the same type of hardware components. When the fingerprints are finished being taken they can be placed on a scanner that can input them into the proper place on a preloaded fingerprint card very simply.

Concept of Operations

*How would a user interact with the device?* Usability: the user will push the start/go button which will start and instructional slide show video on the tablet. Each step will be automatic or require a manual push of the button for safety reasons. It will be a very descriptive video, but seem as simple as "put ink on your finger, put your finger in the hole, push the button, repeat" to the subject using the device.

System Diagram

*What are the main system components and their interrelationships/dependencies?*

*In particular, please address:*

* *Electric/Power source (supply voltage, current) and any battery specifications (if applicable)*
* *Materials of construction – particularly for any part(s) that would contact the subject*
* *Optics/”light” information (type, wavelength, frequency, power)*
* *Original specs from any COTS parts, plus info about any modifications*
* *Description of any mechanical movements*

see 2nd page and anticpate equpment section.

Anticipated Equipment

*What are the software packages and/or hardware components?*

Solution Description: anticipated hardware and software components, 4 nema 17 (or lower) stepper motors, 2 large rollers, 12 rubber rollers, 11 small steel shafts, 8 roller bearings, 1 laser limit switch, two mechanical limit switches, 1 arduino board, 1 stepper motor board, 4 stepper motor controlls, 1 12 volt power supply, 1 tablet, 1 button, some wire, and a housing for the machine, as well as paper and ink, estimated cost around $100. System diagram attached in second page. Also the machine would work on a 1 time G&M code program uploaded to the tablet.

Devices

*Will you be constructing a new device for this challenge or will you be extending the use of an existing device for this challenge? Please select one of the following: Creating New Device or Augmenting Existing Device.*

Creating new device

Matchers  
*A) Which Matcher will your team use for the* ***tenprint*** *to* ***tenprint*** *comparison? Please select one:*

*\_\_\_\_ Government \_\_\_ Custom \_\_X\_\_ Not Sure*

*B) Which Matcher will your team use for the* ***latent*** *to* ***tenprint*** *comparison? Please select one:*

*\_\_\_\_ Government \_\_\_ Custom \_\_X\_ Not Sure*

Safety Assessment

*Are there any components (electrical components, illuminators, etc.) in your design which may cause safety concerns with human subjects testing?*

Safety Assessment: There are no safety concerns with this device. The entire device will be enclosed asside for the hole for the subject to insert their finger. The tightening of the paper around the finger is stopped once it activates a limit swich, so when the paper gets to a certian tightness it will automatically release. Creating enough pressure for a great print, but not so much as to cause any discomfort.

Innovation

*What makes this approach unique?*

It is unique, there is nothing like it on the market.

