Developer Quick Start Guide

Numenta is leading a new era of intelligent machines. We have developed theory, core software technology and multiple applications that address a variety of usage scenarios. Our aim is to make it easy for you to try our machine intelligence technology on problems that are interesting to you. The objective of this document is to give you a high-level overview on how to get started.

Ways to Get Started

We provide multiple ways for developers to explore our machine intelligence technology:

Grok Custom Metrics The simplest and fastest way to explore our technology. Use Grok custom metrics to model streaming data for anomalies.

NuPIC Open Source Community Use NuPIC to explore, expand on and create new applications and technologies that leverage Numenta machine intelligence. Featured capabilities such as *Rogue Behavior Detection* and *Geospatial Tracking* are available through NuPIC

Learn HTM Theory Review our library of HTM resources to learn more about theories and frameworks that underpin our machine intelligence.

Grok Custom Metrics

If you'd like to do a simple and quick exploration of our technology applied to your data, Grok Custom Metrics provides the easiest and cheapest way to get started. Grok Custom Metrics is best suited for identifying anomalies within data streams that have the following characteristics:

- Your data is streaming over time
- You can sample or aggregate the data into 5 minute increments
- You are monitoring discreet data sources
- You are looking for anomalies

Basic Steps:

1. Download and install Grok
2. Configure your data stream as Grok Custom Metric(s)
3. Review visualization of results on the Grok Mobile or Web Client

Grok for IT Analytics and Grok Custom Metrics:

Grok for IT Analytics has been released as a free application through the AWS Marketplace (EC2 server charges still apply). Use of the standard Grok for IT Analytics product does not require any coding to get started. The Grok Custom Metrics feature does require minimal coding, but code samples are provided to facilitate this process.

▸ Grok Download on AWS Marketplace   ▸ Grok Custom Metrics Support Guide
▸ Grok Master Installation and User Guide   ▸ Other Grok documentation

NuPIC Open Source Community

Our core technology and applications are available through our open source project, NuPIC, the Numenta Platform for Intelligent Computing. We are building a growing community in NuPIC of talented developers who are moving forward the state-of-the-art in machine intelligence. NuPIC is available under the industry standard AGPL v3 license. This license enables academics and members of our open source community to explore, expand on and create new technologies within NuPIC. Additionally, this license allows for the distribution (either free of charge, or for a fee) of products that have been created using the technologies contained in NuPIC, as long as developers make their source code freely available in accordance with the AGPLv3.

If you have created something using our HTM technology that you would like to keep proprietary, we offer the ability to transition from the AGPLv3 license to a commercial license. View our License Guide and contact us at sales@numenta.com.

The advantage of building your product on NuPIC is that you have much more flexibility and functionality. Below are some of the additional capabilities for analysis that can be achieved through NuPIC:

- Streaming data at velocities other than 5 minutes
- Models with multiple metrics
- Automated finding of best models
- Encoders for special data types, such as 2D data
- Prediction, in addition to anomaly detection

The disadvantage of building your product on NuPIC is that it requires much more expertise than starting with the other deployment methods. In order to be able to access the above capabilities in NuPIC, members of your team will need to dedicate some time to learning about HTM and to coming up to speed on the code. It is helpful to have some expertise on the algorithms as well. Fortunately, our active NuPIC development community is available to help.

Basic Steps:

1. Read the NuPIC Wiki
2. Install and build NuPIC for your environment and agree to standard APGLv3
3. Dive into the NuPIC codebase to work with core algorithms and application repositories

Numenta Rogue Behavior Detection Application

This application was developed as an internal demonstration, not a commercial product. Results can be obtained by feeding data streams are indicative of human behaviors into either Grok Custom Metrics or the NuPIC.

▶ Rogue Behavior Detection Code on GitHub   ▶ Rogue Behavior Detection White Paper

▶ Grok Download on AWS Marketplace   ▶ Multi-Factor Authentication Hackathon Demo

Numenta Geospatial Tracking Application

This application was also developed as an internal demonstration, not a commercial product. Results were obtained by encoding GPS location, speed and time stamp data, then feeding this data into the CLA. Resources to recreate these results are available through NuPIC.

▶ Geospatial Tracking Code on GitHub   ▶ Geospatial Tracking Video Tutorial

▶ Geospatial Tracking White Paper

NuPIC Codebase and Demonstrations

This contains the HTM source code and algorithms that underpin all of Numenta's machine intelligence technologies and applications. Additional demonstrations are available within NuPIC that explore the range of applications that stand to benefit from our machine intelligence technologies.

▶ NuPIC source code repository   ▶ NuPIC Wiki

Learn HTM Theory

All of Numenta's algorithms and applications are underpinned by Hierarchical Temporal Memory (HTM), a detailed computational theory of the neocortex built on the framework first published in the book *On Intelligence*. Following this framework, we build theoretical models that incorporate the latest advancements in neuroscience research, and translate these models into optimized, high quality software modules that simulate the architecture and processes of the neocortex.

Browse the links below to learn more about the neuroscience and computer science behind our machine intelligence technology.

- *On Intelligence*, by Jeff Hawkins and Sandra Blakeslee
- NuPIC Wiki
- Hierarchical Temporal Memory white paper
- Numenta Resource Library
- YouTube Videos