# SIGNALPOP UNIVERSAL MINER™

GETTING STARTED

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# OVERVIEW

The SignalPop® Universal Miner<sup>TM</sup> is an application designed to help you mine cryptocurrencies (such as Ethereum) and soon mine artificial intelligence problems using the MyCaffe<sup>TM</sup> AI Platform (Brown, 2018). MyCaffe was inspired by the original open source C++ Caffe project created by (Jia, et al., 2014) while at Berkeley. For more information on MyCaffe, see us on **GitHub** at <u>http://github.com/mycaffe</u> or **NuGet** at <u>https://www.nuget.org/packages?q=MyCaffe</u>.

When mining with the Universal Miner, there are several important features to be aware of for they will impact the performance and safety of your mining:

- **Settings**; these are the main settings that specify the mining address where you are to be paid, and the name of your mining machine.
- **Hardware**; the hardware settings allow you to monitor the current GPU temperatures and set hardware tuning settings (if your GPU has a configurable fan).
- **Status**; the status shows the standard mining output that you may be familiar with which typically shows the mining progress, etc.

So let's get started, but before we do, please make sure that you are running on a system that meets the minimum requirements listed below.

# PRODUCT MINIMUM REQUREMENTS

The SignalPop Universal Miner was built for Windows developers running on either Windows 7 or Windows 10 PC's that have at least one NVIDIA CUDA based GPU installed. With that in mind the minimum requirements for the designer are as follows:

- Operating System: 64-bit Windows 7 or Windows 10
- System Memory (PC side): 8 GB or more
- Hard Disk Space: **10 GB free disk space**
- GPU Model: **NVIDIA 1060 or above recommended** (must have CUDA support with compute 3.5 or greater and the latest NVIDIA driver<sup>1</sup>)
- GPU Memory: **4 GB** (6 GB or more is recommended)

# RECOMMENDED GPUS

As of 7/17/2018, the following GPUs are recommended when using the SignalPop Universal Miner:

- <u>NVIDIA 1080 TI</u>
- <u>NVIDIA 1070 TI</u>
- <u>NVIDIA 1070</u>
- <u>NVIDIA 1060</u>

NVIDIA 20 series GPUS (including 2080 TI) are currently **not recommended** for they lack fan control.

<sup>&</sup>lt;sup>1</sup> To get the latest NVIDIA driver, please see <u>https://www.geforce.com/drivers</u>.

# SETUP

Before you start mining, it is important to first change the settings with your mining address and machine name. If you do not change the mining address to your mining address (such as your ETH address) you will not be compensated for your efforts.

# SETTING UP THE MINER SETTINGS

The first step when using the SignalPop Universal Miner is to change the settings to your mining settings.

≽ SignalPop Universal Miner		- 🗆 X
<u>F</u> ile Help		
Welcome to the S The SignalPop Universal Mine a crypto currency, or solving a	ignalPop Universal Mine r manages and keeps your work running w n artificial intelligence problem, we've got	<b>ΓΙ</b> <sup>TM</sup> ith its unique package management system. Whether mining you covered! ereum.11.0
Overview	Settings - WARNING: unless you want make	a mining donation to us :-), change the Primary Address below to your ETH address.
Status		
History	Compensation     Primary Address     General	0xb0d26F749FC3aE8cadb29bA4E224CA4C9Af99e20
Hardware	Name Configuration	wpe.net.miner.ethereum.11.0 C:\ProgramData\SignalPop\Universal Miner\MinerModules\wpe.net.mir
Settings	Secondary Address Secondary Name Secondary Name	0.00%
Account	Parameters     MinerModuleParser	0.00/8
About	MinerModuleExe MinerModuleDII Volts	120.0
Mining for Good	Miner Name Amps Host1 Host2 System Product Version	miningmining777 20.0 us1.ethermine.org:4444 us2.ethermine.org:14444 0.111.0.96
SignalPop using CUDA 11.0.3	Primary Address Specifies the full ETH primary address where you use your address instead of the one listed.	r mining rewards are sent, such as "0xb0d26F749FC3aE8cadb29bA4E224CA4C9A199e20". Note,

# Figure 1 Setting Up

Take the following steps to setup your miner:

- 1.) Select the 'Settings' button on the left of the Universal Miner.
- 2.) Change the 'Primary Address' to your ETH address.
- 3.) Change your 'MinerName' to the name that you want to see on ethminer.org for the machine.
- 4.) Press the 'Save' (🚽) button to save your settings.

#### SETTING UP THE HARDWARE

After saving your miner settings, you will want to setup the hardware used to mine. To make these changes, select the 'Hardware' button on the left of the Universal Miner.

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Welcome to the Si The SignalPop Universal Miner a crypto currency, or solving ar	ignalPop Universal Miner! <sup>™</sup> er manages and keeps your work running with its unique package management system. Whether mining an artificial intelligence problem, we've got you covered! • wpe.net.miner.mycoffe • wpe.net.miner.ethereum.11.0	
Overview	Hardware	•
Status	Machine BASE8 Host BASE8	00.1
History	Memory 68.60 GB total/36.36 GB free GPU Watts 401.25W (3.3	34 amp)
Hardware	Operating System Microsoft Windows NT 6.2.9200.0 (64-bit)	
Settings	GPU #0         Quadro RTX 8000 (51.14 GB - P2P on)         60 C         35 C         0 %         51.1 GB         300         405	Fan n/a 🕾 📼 🔊
Account	GPU #1 GeForce RTX 2080 Ti (11.81 GB - P2P 60 C 44 C 1 % 11.8 GB 300 405	n/a 🕾 🖂 🖞
About	✓ GPU #2       TITAN Xp (12.80 GB - P2P on) sn = #9       60 C       32 C       0 %       12.8 GB       139       405       130	50 % <mark>⊮</mark> □ 1
Mining for Good		
SignalPop		

# Figure 2 Setting up the Hardware

To set up the hardware, take the following steps.

- 1.) First select the GPU's to use when mining you must select at least one.
- 2.) Next, set your target temperature by selecting the 'Edit' (2) button to set the turning targets for temperature and overclocking offsets.
- 3.) Save your settings by pressing the 'Save' (🖃) button.

Hardware tuning is only provided on GPU's that have configurable fans. When using hardware tuning, set your target temperature to a reasonable, yet safe temperature for your GPU. We have found 60 to 65 degrees Celsius to be good target temperatures. With a setting of 65 degrees Celsius, you may see your GPU temperatures rise above into the 70's Celsius depending on your environment, computer cabinet, etc. However, we do not recommend running your GPU's higher than 75 Celsius for doing so may damage your GPU hardware.

**IMPORTANT:** When using hardware tuning, initially the hardware tuning searches for the optimal fan rate to keep you temperatures within a 5 degree Celsius band of your target. During this process, you fans will rise up to 100% for a while and then slowly back-off until the optimal fan speed is found for the given temperature. Our hardware turning errors on the side of adding more cooling instead of less for less cooling may cause hardware failure.

# OVERCLOCKING

**NOTE:** Currently overclocking is unavailable, but due to be released in a future release after we complete our testing.

**WARNING:** When overclocking your GPU(s), you need to be careful for you could void your GPU warranty, damage your GPU, your computer or even worse cause a fire. If you are going to overclock your GPU(s) it is up to you to determine the best overclocking values that do not lead to excessive heat generation in your GPU. Increasing the overclocking will run the GPU at a hotter temperature and may cause it to malfunction.

A new GPU is typically set to its factory-set reference clock speed for both the GPU and the memory. The following are common reference clock speeds that we have seen. All GPU's shown are NVIDIA based GPU's from different card manufacturers:

GPU	GPU Reference Clock	Memory Reference Clock
From NVIDIA - Titan Xp	1835 - 1847 MHz	5508 MHz
From EVGA – 1080 ti	1835 – 1975 MHz	5005 MHz
From EVGA – 1080 ti	1885 MHz	3802 MHz

Keep in mind that these values are not set in stone for one manufacture may ship their GPU's with a different reference clock speed than another – these are just the reference clock speeds that we have seen in our GPUs.

When overclocking, we have found that overclocking the Memory Clock and under-clocking the GPU Clock has the best performance/temperature for mining a cryptocurrency. However, when mining an artificial intelligence problem, we have found that you <u>do not</u> want to under-clock the GPU.

We have found that overclocking the Memory by around 600 Mhz and under-clocking the GPU by 200 Mhz creates a reliable result that does not crash the GPU and maintains a temperature range that can be managed with remaining fan speedup available (e.g. if the fan is running at 70%, a 30% speed-up is available).

**IMPORTANT**: Even though we have seen positive results with these speed-ups, we have had a few Gigabyte 1070 GPU's fail using these settings and our ambient temperature environment may be very different from yours. If you live in an area with a relatively warm ambient temperature (80 degrees Fahrenheit or more) you may not be able to overclock at all. The reading to watch very closely when overclocking is your **actual GPU temperature**. We do not recommend overclocking <u>at all</u> if you're actual GPU temperature is at or rises above 65 degrees Celsius. When enabling the overclock tuning, we

recommend that you set your target temperature to a value of 65 degrees Celsius or less for we will not overclock if the actual temperature rises above the target temperature + 5 degrees Celsius.

# START MINING

To start mining, just select the 'Start' ( ) button in the upper right corner of any window. To stop, just press the 'Stop' ( ) button.

SignalPop Universal Miner			-	• ×
<u>F</u> ile Help	74			
Welcome to the S	ignalPop Universal Miner!	nackago managoment system . Wh	other mining	
a crypto currency, or solving a	in artificial intelligence problem, we've got you covered!	package management system. win	etter minnig	
	• wpe.net.miner.mycaffe			
Overview	Overview     mining gmining 777			• =
Status	miningminingmining///	IDLE		
History				
Hardware	50000		Mh/s	
Settings	speed	0.00		
Account	Job Count	0		
About			_	
Mining for Good	Acceptance Rate	0.00	%	
	Rejection Rate	0.00	%	
using				
	hardware on 0 57 C	1 48 C	2 32 C	

Figure 3 Starting and Stopping Mining

Once started, the status will change from 'IDLE' to 'RUNNING' and after an initial startup period you will see your 'Speed' Mh/s increase.

# MONITORING YOUR MINING

When mining, by far, the most important information to watch are the actual temperatures of your GPU's. Ideally your GPU temperatures should not exceed 75 degrees Celsius. If you live in a cold environment this should not be a problem.

However, if you are located in a warmer climate where the ambient temperature is 26.2 Celsius (80 F) or higher, maintaining the 75 degrees Celsius may be a challenge. During such times, you will want to increase the ambient cooling around your mining machines or not mine at all for unfortunately there is only so much the GPU fans can do.

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<u>F</u> ile Help				
Welcome to the SignalPop Universal Miner! <sup>™</sup> The SignalPop Universal Miner manages and keeps your work running with its unique package management system. Whether mining a crypto currency, or solving an artificial intelligence problem, we've got you covered!				
Overview	Overview			
Status	miningmining777		13:16:04	
History				
Hardware	Speed	120 24	Mh/s	
Settings	speed	137.20		
Account	Job Count	13		
About				
Mining for Good	Acceptance Rate	0.00	%	
	Rejection Rate	0.00	%	
	nardwara 37			
	tuning ON 75 C	1 69 C 2	6/ C	

#### Figure 4 Active Mining Overview

The current temperature of each GPU is displayed along the bottom of the 'Overview window and also in the 'Hardware' window.

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Welcome to the Si The SignalPop Universal Miner a crypto currency, or solving ar	gnalPop Universal Miner! <sup>™</sup> manages and keeps your work running with its unique p artificial intelligence problem, we've got you covered! • wpe.net.miner.mycaffe • wpe.net.miner.ethereum.11.0	ackage managemen	t system. Whether mini	ng
Overview	Hardware			
Status	Machine BASE8		Host BASE8	9 200 1
History	Memory 68.60 GB total/36.17 GB fr	ee	GPU Watts 481.25V	V (4.01 amp)
Hardware	Operating System Microsoft Windows NT 6.2	.9200.0 (64-bit)		
Settings	GPU #0 Quadro RTX 8000 (51.14 GB - P2P on) 60 C	Temp         GPU           35 C         0 %	Memory         GPU         Memory           51.1 GB         300         405	pry Fan
Account	GPU #1 GeForce RTX 2080 Ti (11.81 GB - P2P 60 C	44 C 1 %	11.8 GB 300 405	n/a 😭 📼 එ
About	✓ GPU #2 TITAN Xp (12.80 GB - P2P on) sn = #9 60 C	67 C 100 %	12.8 GB 1873 550	3 <mark>100 %</mark> 🚰 💷
Mining for Good				
SignalPop. CUDA 11.0.3 version 0.11.0.78 (ariver 452.06)				

# Figure 5 Active Mining Hardware

The 'Hardware' window shows additional information such as your temperatures for each GPU (when using hardware tuning), the current GPU usage, GPU memory, GPU clock, Memory clock and Fan usage.

NOTE: Only GPU's that offer configurable fans support hardware tuning.

# PERFORMANCE MONITORING

Once you are happy with how your hardware is configured and performing, you may want to see how well your mining rig performs over time.

There are two aspects to mining profitability:

- a.) your average hashes/second (e.g. Mh/s) and,
- b.) your overall up-time.

You may have the fastest machine in the world, but if it does not have a very good up-time your overall profitability will be poor.

房 SignalPop Universal Miner		<u>10</u> 2	
<u>F</u> ile Help			
Welcome to the Si The SignalPop Universal Miner a crypto currency, or solving ar	gnalPop Universal Miner! <sup>TM</sup> manages and keeps your work running with its unique package management system. Whether mining artificial intelligence problem, we've got you covered!		
Overview	History		
Status	Acceptance Speed		121.27
History	Restarts		90.73 75.61
Hardware	T <sup>-1</sup>		45.37
Settings			_
Account	GPU0 Temperature GPU1 GPU2		82.35
About			47.06
Mining for Good			- 35.29 - 23.53
	GPU0 Fan%		- 11.78
	GPU 1 GPU 2		66.67
			33.33 16.67
		111111	1111 <b>-</b> 0.00

The 'History' window shows how well your mining rig performs on a hashes/second basis. In addition, the % of Mh/s that were used on 'accepted' solutions is shown in green along with the % of Mh/s that were rejected.

To view your overall performance, select the 'Account' button which will bring up your account on <u>www.ethermine.org</u>.

#### MINING FOR GOOD

While mining, you may want to give a portion of your mining time to a charity. To do so, select the 'Mining for Charity' button to display the 'Mining for Charity' screen.



# Figure 6 Mining for Charity View

Selecting the 'Apply to Settings' button directly saves the mining for charity settings to your general settings as shown below.

<ul> <li>Mining for Charity</li> </ul>	
Secondary Address	0xc7464dbcA260A8faF033460622B23467Df5AEA42
Secondary Name	GiveDirectly
Secondary Address Mining Percent	5.00%

When mining for charity, we use a similar method of time allocation as is used to pay the developer fee in that we mine for the percentage of the day that you specified (e.g. the 'Secondary Address Mining Percent') with the 'Secondary Address' which in this case is the Ethereum address used by the GiveDirectly charity. For more information on GiveDirectly select the 'URL' on the screen, or go to <u>https://givedirectly.org/</u>.

# MINING AI

The SignalPop Universal Miner<sup>™</sup> now supports *mining AI* work packages via the **wpe.net.miner.mycaffe** miner! Mining AI is the process of training a work package delegated to the miner from the Scheduling database.

SignalPop Universal Miner			– 🗆 X
End         Help           Welcome to the S           The SignalPop Universal Mine a crypto currency, or solving a	signalPop Universal Miner! <sup>™</sup> er manages and keeps your work running with its unique an artificial intelligence problem, we've got you covered!	package management system. Whethe	er mining
Overview	wpe.net.miner.mycoffe     wpe.net.miner.ethereum.11.0     Overview		<b>•</b>
Status	mycatte///	IDLE	
History	Scheduler: .\DNN		
Hardware	Speed	0.00	Iteration/m
Settings		0.00	
Account	Job Count	0	
About			_
Mining for Good	Acceptance Rate	0.00	%
	Rejection Rate	0.00	%
SignalPop	hardware on 0 53 C	977 1 61 C	2 42 C

# Figure 7 Mining MyCaffe AI

Mining AI is the same as mining Ethereum except when mining AI the speed is measured in iterations per minute instead of mega-hashes per second. In addition, each AI Job represents a project that is trained vs an Ethereum transaction that is verified when mining Ethereum.

Al mining jobs are delegated via the *Scheduler* which may reside locally, on a local network. The *Scheduler:'* field in the *Overview* screen shows which scheduler is in use.

**NOTE:** when mining AI, the Account and Mining for Good windows are not available.

# MINING AI SETTINGS

When mining AI, the settings are a little different from those used when mining Ethereum.

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<u>F</u> ile Help		
Welcome to the Si The SignalPop Universal Miner a crypto currency, or solving an	gnalPop Universal Mine manages and keeps your work running artificial intelligence problem, we've g	xith its unique package management system. Whether mining t you covered! thereum.11.0
Overview	= Settings	
Status		
History	Vame Configuration	wpe.net.miner.mycaffe C:\ProgramData\SignalPop\Universal Miner\MinerModules\wpe.net.mir
Hardware	Parameters     ScheduleServer     Priority	DEFAULT True
Settings	Miner Name Amps DataRefreshPeriod	mycaffe777 20.0 10000
Account	DataReplacementPercent VerboseOutput	0.3 False
About	Path  System  Product Version	0.11.0.96
Mining for Good		
SignalPop CUDA 11.0.3 version 0.11.0.96	ScheduleServer Specifies the server used for scheduling where 'server;database;username;password' is expec	DEFAULT' uses the scheduling database on the local machine, otherwise the format ted and used to connect to the scheduling database.

#### **Figure 8 Mining AI Settings**

There are two settings that are specific to AI Mining:

**ScheduleServer**; the schedule server defines where AI work packages are delegated from. This setting is ether 'DEFAULT' for the local machine database (if running on a machine where the SignalPop AI Designer is also installed), or **server;database;username;password** which specifies to use a specific database server (encrypted on save).

**VerboseOutput**; when True, the verbose output directs a details status output to the Status window. Otherwise, when False, a more simple output is used.

# SIGNALPOP PRODUCTS

At SignalPop, we strive to create innovative products that help solve difficult problems. The following products are offered by SignalPop.

**MyCaffe AI Platform**; the MyCaffe AI Platform was inspired by the original open source C++ Caffe project created by (Jia, et al., 2014) while at Berkeley. For more information on MyCaffe, see us on **GitHub** at <u>http://github.com/mycaffe</u> or **NuGet** at <u>https://www.nuget.org/packages?q=MyCaffe</u>. Using MyCaffe you can easily create complex, deep learning models to solve difficult artificial intelligence problems.

**SignalPop AI Designer**; designed specifically for the MyCaffe AI Platform, the SignalPop AI Designer allows you to visually develop, test and debug complex deep learning models such as ResNet, DANN, AlexNet, GoogleNet and VGG.

**SignalPop Universal Miner**; designed to mine anything from a cryptocurrency to an artificial intelligence problem, and do so 24/7.

For more information on our products see <u>https://www.signalpop.com</u>.

# REFERENCES

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