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## GSX: Small Classes, Big Lies

On May 18<sup>th</sup>, we published our research on GSX in which we concluded that at least 70% of GSX's purported users are fraudulent, and quite likely the real percentage of fake users is over 80%. We detailed three behaviors we were highly confident evidenced widespread bot usage: "Precise Joiners", "GSX IP Joiners", and "Burst Joiners". A fourth pattern "Early Joiners" is highly likely indicative of bots. A former GSX manager corroborated our conclusions, and even detailed how GSX's bot operations work.<sup>1</sup>

GSX's responses since consist largely of drivel, designed to obfuscate and lie. We maintain our view that GSX is a massive fraud – i.e., it is a nearly empty box. Making GSX's denials even more farcical is that it openly recruits engineers to help it run bot farms, which we show in this report.

### GSX Gives the Finger to its Investors

GSX actually published two responses (of which we are aware) to our report. The first was a non-substantive press release in English.<sup>2</sup> GSX however released a more detailed response in Chinese through WeChat, which we suspect very few U.S. investors use.<sup>3,4</sup> These responses clearly seem intended to deceive.

GSX's WeChat response contains techno-drivel, and appears intended to appear authoritative when it includes the below screen shot of GSX's purported queries to analyze Precise Joiners and Burst Joiners. However, the screenshot prima facie shows GSX is obfuscating its presentation. It omits three important fields: "agent\_id", "agent\_policy", and the crucial "timestamp". The timestamp field is a significant omission that prevents further analysis based on *when* GSX's class switch message was sent. Therefore, this is not usable data. Investors need look no further to know GSX is screwing with them.

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<sup>1</sup> See Muddy Waters' May 18, 2020 report, pp. 10-13.

<sup>2</sup> <https://www.prnewswire.com/news-releases/gsx-refutes-muddy-waters-researchs-allegations-301061639.html>

<sup>3</sup> WeChat is primarily used by Chinese speaking users. It is largely a chat and news forum and a site for unvetted blogs, posts, news, links. The selection for this channel for the more detailed reply appears intended to help Chairman Larry Chen protect his personal reputation in China, rather than provide more or useful information to international investors and shareholders. The choice of WeChat as the site to release additional details seems to contradict the claim by management in the official response that "GSX is committed to the highest standards of corporate governance, as well as transparent and timely disclosure..."

<sup>4</sup> <https://mp.weixin.qq.com/s/8ekeJKN2n8tPXWwP9jxmqq>

```

20:00:41 {"class_id":"60050902964181951","group_id":0,"message_type":"class_switch","target_class_id":"6005060588218041","target_group_id":5374587
"user_id":"19714349"}
20:00:41 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716841","user_id":"19909517"}
20:00:41 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716841","user_id":"37919"}
20:00:41 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716841","user_id":"50228"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"56105"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"542659678"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"19948910"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"19935050"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"539419035"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"19933893"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"57653"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"624665526"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"37931"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"19954583"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"19950977"}
20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"19999445"}
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20:00:42 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716842","user_id":"591144274"}
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20:00:43 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716843","user_id":"59099"}
20:00:44 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716844","user_id":"19973252"}
20:00:44 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716844","user_id":"19977587"}
20:00:44 {"class_id":"60050902964181951","message_type":"user_out","ts":"1589716844","user_id":"19955387"}

```

```

{"agent_id"
"agent_policy"
"class_id"
"group_id"
"message_type": "class_switch"
"offset_timestamp"
"target_class_id"
"target_group_id"
"timestamp"
"user_id"
},

```

GSX data missing 'agent\_id', 'agent\_policy' and crucial 'timestamp' field.

## Response to GSX IP Joiners

GSX's response to the GSX IP Joiner analysis strikes us as a bald face lie.

In our report, we discussed how we had analyzed 463,217 sign in records for 54,065 unique users. We were able to identify GSX employees (teachers and tutors) in the data, based on how GSX coded them. What we then found was damning – 28.2% of purported students shared an IP address at one point with GSX tutors or teachers. This amounted to 15,239 purported students. With no physical school or learning center locations, we believe this is convincing evidence of significant bot usage.

GSX responded by purportedly querying its entire database to find overlaps between GSX teacher / tutor IPs and students. In the press release, GSX claimed that only 0.78% of students have an overlapping IP. The WeChat response shows these purported query results, with 43,843 overlapping IPs.

student_ips	union_ips	union_pct
5617835	43843	0.007804251993873084

This purported query fails our laugh test. Our data set of 165,111 total distinct IP addresses was only 2.9% of GSX's claimed query data set, yet it yielded 34.8% of GSX purported overlap number. We cannot remotely believe GSX's claim.

## **Response to Precise and Burst Joiners**

In our report, we explained that 10.6% of users joined on the same second, the same day of the week, but on different weeks. We analogized that phenomenon to a weekly flight between two cities touching down at exactly the same second on two occasions. We also explained a common phenomenon (Burst Joiners) in which large groups of users (e.g., 20 or 30) join within the same second. We excluded bursts that occurred within five minutes before to five minutes after the start of classes.

GSX's response to these joining patterns is inadequate. It claimed that both phenomena are caused by switching of small class groups led by tutors over to the large class. However, this does not explain the Burst Joiner phenomenon because we excluded bursts within five minutes on either side of the start of class. (Recall that GSX omitted the timestamp from the screenshot above where GSX purported to show the switching is based on this signal.)

GSX's claim that switching from the small classes to the large explains Precise Joiners is also inadequate. In the WeChat response, GSX stated that if a tutor has not switched the small class over by the start time of the large class, the system will automatically perform the switch. However, only 5,742 unique users were Precise Joiners, which was 10.6% of the sample.<sup>5</sup> GSX states that such small class to large class switches are "typical", and that there is an automatic switch for tutors that fail to switch by the class start time. If that were the case, then we would expect to find far more than 10.6% of the sample being Precise Joiners. This explanation again falls short in explaining an observed phenomenon.

## **GSX Openly Recruits for Bot Operators**

GSX's use of bots is so pervasive that it even openly recruits for engineers to develop and maintain its bot army. The images below are of recent job postings. The first is for a GSX "server room operation and maintenance engineer." This post reveals specific details regarding GSX's operations, which is likely the reason it was taken down.

This post was picked up by a user of China's Snowball Finance (雪球) who on May 6<sup>th</sup>, posted the screenshot and asked, "do you understand what this is for?"<sup>6</sup>

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<sup>5</sup> This excludes the users who were linked to Precise Joiners by IP address or joining at the same second.

<sup>6</sup> <https://xueqiu.com/5346637144/148620489> (underlines added)



*Do you understand what this is for?*

Server Room Operations & Maintenance Engineer

GSX, Server Room Operations & Maintenance Supervisor

Performance Bonus:  
1-4 mos. based on end of yr. salary, varies

Duties:  
Responsible for maintaining and operating company's sever rooms.

1. Resolving problems occurring with cell phone equipment in the server room.
2. Cell phone bot network equipment, install all types of framework software like Xp and TaiChi, etc.
3. Huawei servers maintenance and operations.

Xp and TaiChi are ideal for the customized development and operation of complex and secretive bot networks.

- We believe “Xp” refers to Xposed, a set of tools that allows an individual to modify an Android phone or perform tasks on it that it normally cannot when the phone is received out of the box from the manufacturer.<sup>7</sup> When a hacker "jailbreaks" or "roots" a phone, he or she typically wants to install customized software.
- TaiChi:<sup>8</sup> According to its website, TaiChi supports a variety of Xposed modules enabling functions like a “fake device”, “fake location”, and has the added feature of being “hard to detect.”

We found it mildly surprising that considering all the news on GSX and bots, GSX job posts for engineers experienced in the operation and maintenance of large-scale bot networks have not all been taken down. However, because GSX appears so dependent on its bot network to support its fake business, it likely has little choice but to continue recruiting.

<sup>7</sup><https://repo.xposed.info/module/de.robv.android.xposed.installer>

<sup>8</sup><https://taichi.cool/module/>, <https://taichi.cool/doc/>

Another recent related job post from April 29, 2020 is below.<sup>9</sup> This job post is also seeking cell phone engineers to be responsible for “rooting” or “jail breaking” cell phones, installing new software, and creating bots or fake users.<sup>10</sup>

**手机运维工程师**  
Cell Phone Engineer, Operations & Maintenance

工作要求

工作地区: 北京      工作经验: 1年以内      职位类型: 全职  
 工资待遇: ¥ 5000-6000      学历要求: 大专以上  
 工作地址: 北京海淀区博彦科技大厦西楼

定期体检   节日福利   交通补助   包三餐   年终双薪

**Job responsibilities: 1, responsible for rooting (jail breaking) cell phones, bots, and software installations. 2, WeChat registrations, and WeChat message initializations, etc.**

岗位职责/工作内容/岗位要求

工作职责: 1、负责手机root, 刷机, 软件安装等 2、微信注册、微信信息初始化等  
 3、处理内部客户的技术问题  
 4、负责手机日常维护, 管理手机, 升级, 欠费充值, 解封好友等  
 任职资格: 1、踏实肯干, 积极主动 2、具备良好的团队合作精神和高度的责任感  
 3、具有较强的协调能力, 较强的抗压能力

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 最近更新: 2020-04-29  
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职位已关闭

**手机运维工程师 5-6K**

北京 · 1年以内 · 大专

五险一金   补充医疗保险   定期体检   年终奖   带薪年假   员工旅游   通讯补贴

别先生 HR · 刚刚在线

职位描述

工作职责:

- 负责手机root, 刷机, 软件安装等
- 微信注册、微信信息初始化等;
- 处理内部客户的技术问题;
- 负责手机日常维护, 管理手机, 升级, 欠费充值, 解封好友等;

任职资格:

- 踏实肯干, 积极主动
- 具备良好的团队合作精神和高度的责任感;
- 具有较强的协调能力, 较强的抗压能力

公司介绍

慕维学 (股票代码: GSX) 是中国第一家在美国上市的K12在线教育机构, 主要业务为K12在线课外辅导培训以及成人在线课程培训。  
 2015年3月30日, 宣布A轮融资5000万美元, 刷新了中国创业公司A轮融资记录。  
 2015年11月, 获福布斯发布的福布斯2015中国成长最快科技公司Arduo

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These job posts also list as one of the top duties of this cell phone engineer the need to be able to set up WeChat accounts and initiate messages. On the surface, this seems ridiculous as nearly all Chinese users with a smart phone know how to do this, even without an engineering background. However, the problem of not just fake students but also fake users in GSX’s WeChat groups has been reported by participants. These WeChat groups are formed by the tutor after a class sign up and are intended to engage the family. As with GSX’s fake students and fake registrations, it seems management felt compelled to deal with the problem of shortages of real family members in the parent groups through its default SOP; therefore, it called on its robot army and engineers to fill the void.

We expect management will wrack its brain to find another excuse about why it is hiring engineers to run its internal bot network. We thought we would help. Management or IR, please feel free to cut and paste the reply below.

“Muddy Waters does not understand our business or its operating environment. Because bots and fake users are now so prevalent throughout the internet environment in China, we hire and train specialists in bot operations as a matter of quality control. We must build and run these large-scale bot networks internally against our own system to make sure we can effectively block them. We do this to maintain the integrity of the livestreaming classroom and learning environment and provide a safe, “bot free” space where students can learn.”



<sup>9</sup> [https://www.zhipin.com/job\\_detail/19bacff023f680b71Hd52Ni\\_FFM~.html?sid=seo\\_aladingb](https://www.zhipin.com/job_detail/19bacff023f680b71Hd52Ni_FFM~.html?sid=seo_aladingb), <https://www.jobui.com/job/158236612/> Note, the two posts are linked.

<sup>10</sup> Bots and fake users are called “brushing” (刷) in Chinese, this can be thought of as a kind of automatic swiping function in an app, with the result that purchases, reviews, likes, comments or other such fake activities are created.