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无人驾驶技术的美好图景

文 | 泰德·普林斯

眼下无人驾驶汽车是一个科技热点，谷歌是开风气之先者，很多汽车生产商，比如宝马、福特等随即跟进，现在苹果也加入了战阵。那么，这项技术只是昙花一现还是会深入大众的日常生活呢？如果是后者，它会朝什么方向发展呢？

谷歌无人驾驶汽车的测试样车。

市场前景广阔

我认为无人驾驶将有长足发展，因为这项技术非常可行。当然，它在得到全面推广应用之前还需要解决大量法律及交通规则方面的问题，但这些问题终将得到解决。在我看来，发展无人驾驶是大势所趋，原因如下：

第一，虽说无人驾驶也不能完全杜绝交通事故，但这总比有人驾驶的安全性更高。基本上，允许行为不可预知的人类开车上路算是件蠢事，禁止人们亲自开车之后，交通事故必将大大减少。

第二，无人驾驶有利于降低成本。如果大巴不再需要司机的话，运营一条公交线路的成本就能大大节省，养私家车也是如此。

第三，让人们能节省下精力做更多其他的事。人们可以把不必亲自驾车而节省下的时间用于做其他事，这有助于提高工作效率。如果亿万

人都将因此而节省的时间投入到生产中，将极大地提高社会生产力，说不定这会引发一次新的生产力革命，我们不妨称其为“机动性革命”（Mobility Revolution）。

第四，可以降低犯罪率。很多犯罪分子在作案时都离不开汽车，如果能通过某种方式控制汽车的使用，就能增加犯罪的难度。

第五，缓解交通堵塞。汽车的无人驾驶系统可以更有效率地利用互联网来了解交通拥堵情况，这将使道路交通变得更加顺畅，路上行驶车辆的平均时速会高于有人驾驶的平均时速，从而能节约大量能源，减少排放，改善空气质量。

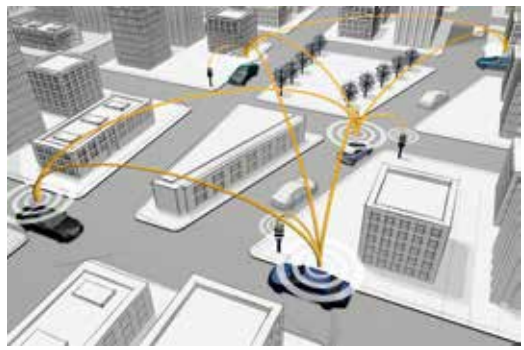
现在几乎所有的大公司都想在这个领域分一杯羹，它们抢占市场的能力非常强，由此就引发了以下问题：创业公司如何有效地进入无人驾驶市场，它们还有立足的机会吗？这个领域中有没有什么业务是创业公司可以做，而大公司目前没有做，以后也不会去做的？

我感觉，迄今为止，人们把无人驾驶汽车的发展想得太简单了。无人驾驶软件本身已经足够复杂，但就目前我看到的而言，帮助无人驾驶汽车进入人们日常生活的配套措施还是空白。似乎大家觉得无人驾驶带来的改变只是不再需要人亲自来开车，其实不然，无人驾驶技术投入实用要求更多方面作出相应的改变，这些求变的领域正是适合初创公司生根发芽的沃土，也为高科技的发展提供了良机。

促进人际交往的利器

在我看来，未来无人驾驶汽车会往两个方向发展：一是人们习惯观念中的无人驾驶汽车，其主要特征是“传统汽车外观+无人驾驶技术”；二是非传统的无人驾驶车辆，其主要特征是“长得不像汽车，但属于无人驾驶的交通工具”。进一步讲，随着无人驾驶技术的发展，汽车的物理设计及社会属性设计方面将发生重大变化。

目前的汽车，不管是不是具备无人驾驶功能，大结构都差不多。当汽车不再需要司机的时候，它的外观和内部空间布局就完全可以换个样子了。比如，车辆的外观和内部完全可以设计



奔驰、宝马等公司都开发了自己的 Car-to-X 联网系统，汽车与交通设施和其他车辆可以实现互联，这是自动驾驶技术的一个重要组成部分。

泰德·普林斯
佩斯领导力研究院创始人暨 CEO

成一幢公寓或是一间艺术工作室的样子，车里可以布置得更像个房间，乘客可以面朝来路而坐，坐席可以分上下两层甚至更多层，等等，这方面的想象力完全可以更开阔一些。

无人驾驶汽车的社会属性特征是一个更根本的问题，因为这类汽车彼此能够通过互联网建立起紧密的联系，结成不同类型的汽车社群。在这一概念中，汽车似乎有了生命，它们可以成为组织内一个个重要的成员。车辆间通过App相互连接，彼此协调行动，根据不同的软件设计承担不同的职责，有的是司机，有的是医生，有的是活动组织者。通过App，无人驾驶车辆可以自主地收发电子或是可视化信号，告诉其它车辆自己正在寻找什么样的伙伴，以及其它车辆如何参与进来。这种App甚至还可以帮车主收发交友信息，那这车就成了移动红娘。

这样的汽车社群能更好地统一行动，共同实现某种社会功能，比如结成长途运输的“公路列车”（road train），组织聚会、赛车或是演出。除了临时组团出门旅行，完成紧急救灾等任务之外，大家还可以结成长期的家庭或邻里车队。

在这一概念下，无人驾驶汽车的功能将扩展到人际交往领域。汽车能自主地依车主的兴趣爱好或是职业特点组织起一个个在线社区，能自主地帮车主找到同道中人，甚至还能帮他们订约会。App将赋予无人驾驶汽车某种特定的性格，购车人可以定制不同性格的汽车，比如友好的、好学的、勇敢的、不服输的……车辆的物理设计可能也需要随其个性而有所变化。在这方面，初创公司有着广阔的用武之地。

有没有想过无人驾驶自行车?

现代城市生活面对着两大难题:交通拥堵和环境污染。汽车是交通拥堵的源头,在制造环境污染方面也难辞其咎。那么,这些问题会因为我们换用无人驾驶汽车而有所缓解吗?答案是“不会”,如果我们不同时采取其他措施的话。这里所说的“其他措施”,我是指无人驾驶的单人交通工具——无人驾驶自行车。

可能有人会觉得我的这个想法很荒谬,他们会问:即便装上了引擎,两轮的自行车又怎么能无人驾驶呢?在回答这个问题之前,我们不妨一起来看看近几年问世的新型交通工具。想必你见过那种两轮电动平衡车,人站上去就能稳稳当当地地前进,对这种车来说,要实现无人驾驶不是什么难事。现在最新型的此类产品是电动滑板车(electric hoverboard),这种最新版本的单人交通工具的主体部分是两个平行的轮子,也有的是两个轮子一前一后呈一条线排列,甚至还有独轮的版本。使用这种车完全不需要什么技巧,只要站上去它就能往前走了。

电动平衡车之所以能自动保持平衡,是因为内部安装了一个电子陀螺仪?它能通过复杂的计算控制程序来实现车体平衡。为什么不在自行车上装一个陀螺仪呢?那样它也能自动平衡直立了,再装上一个实现无人驾驶的微电脑,这不就是一款新型交通工具了吗?

我认为无人驾驶的单人交通工具是无人驾驶车辆的发展方向之一,如果大批开车的人转而使用无人驾驶电动滑板车等单人交通工具,交通拥堵和环境污染就能得到极大的缓解。毕竟滑板车比汽车的尺寸小太多了,而且电力驱动能大大减少环境污染的产生。

当然,要实现这种转变少不了外力的推动,比如政府制定政策提高有人驾驶汽车上路行驶的成本。但目前来看,单靠这种手段效果不是很明显,政府还应当为无人驾驶的电动自行车和电动滑板车设立专用车道。无人驾驶的单人交通工具有了专用车道之后,使用者对行驶安全的顾虑将大大降低,人们能比骑普通自行车更快、更安全地上下班,交通就会比现在顺畅得多。

我认为无人驾驶的单人交通工具是无人驾驶车辆的发展方向之一,如果大批开车的人转而使用无人驾驶电动滑板车等单人交通工具,交通拥堵和环境污染就能得到极大的缓解。

小巧、便宜、速度又能满足需要的无人驾驶单人交通工具必将受到大众的欢迎,因为人们已饱受拥堵和污染之苦。发展无人驾驶单人交通工具还有许多事要做:这种交通工具使用的控制软件与无人驾驶汽车用的软件是不同的,因为前者的行驶速度不会很快,防撞等功能的设计也需要采取不同的方案;在硬件方面也有很多事需要重新考虑,比如适合无人驾驶汽车使用的重力感应器对单人交通工具来说就显得太笨重了,因此需要重新设计,主要是缩小尺寸,以便应用在不同类型的单人交通工具上。

再进一步展开想象,无人驾驶的单人交通工具也可以拥有个性啊,它们的个性可以根据主人的性格、爱好、职业、个人发展目标等因素来确定。同样,无人驾驶的单人交通工具之间也能建立具有社会属性的联系,建立社区,它们也完全可以帮助主人安排社交活动。

技术与人结合创造无限可能

在前面这些设想化为现实的过程中,还会产生很多我们现在还想不周全的需求和可能。比如,城市中的无人驾驶交通工具可以与整个城市的气质和功能相协调,一个想侧重发展医疗研究的城市,可以让城市中无人驾驶车辆的性格偏向医疗主题,比如更多地具备锻炼、健身、营养方案设计等功能。无人驾驶车辆可能还有助于解决一些社会问题,比如老年人的孤独问题。人们的车辆通过App实现社会化连接之后,整个城市便也实现了社区化连接,人与人之间的社会交往有了新的渠道,传统方法很难解决的一些社会问题便可能迎刃而解。

从这个角度来讲,无人驾驶不仅是一种科学技术,它更能成为联系社会与人的工具。用无人驾驶车辆解决社会问题和情感问题,我认为这是值得企业家们考虑的一个业务发展方向。

"Self-Driving Bicycles Are the Next Big Thing!"

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I want to start this article with a disclaimer. I am probably the worst person in the world to talk about self-driving bicycles. That's because for many years I owned motorcycles.

My last motorcycle was a Yamaha FJ 1200. I got rid of it because I figured sooner or later I would kill myself on it. That was because it wasn't self-driving!

If instead it had been self-driving I wouldn't have had to get rid of it because it would have been so safe I could never kill myself on it. But if it was that safe, I guess I would never have bought it because it was too bland. So I guess that means I am the worst person in the world to write about self-driving bicycles and self-driving motorcycles as well!

Self-driving cars are now all the rage. It started off with Google; now many auto companies are in o the act including BMW and Ford. Now even non-auto companies are buying in such as Apple. Is this a fad or is it real? And if it's real, where is it all going?

First I have no doubt that it's real. The technology works. Sure there are numerous legal and regulatory issues to resolve, but that will get done. But in my view there are several reasons it's an inevitable trend. These are:

1. It will be safer; although there will still be accidents, there will be far less when humans aren't allowed to drive cars. Basically humans driving cars is a stupid thing to allow.
2. It's cheaper; if you don't need a bus driver, that eliminates 80% of the cost of operating a bus line; the same goes with private drivers.
3. It liberates more time: now instead of driving you can do productive work; taken over the billions of people who drive cars that's a monumental productivity increase; it's so big it will actually constitute a new revolution, just like the industrial Revolution. We will call this one something like the Mobility Revolution.
4. It will reduce crime; think how much crime is based on using cars; to get criminals to and from the scene of the crime for example. If you control who drives the car it will make it more difficult for criminals to commit crimes.
5. It results in less congestion: once you have self-driving cars, they can tap into networks which show them how to avoid congestion; this will free up the flow of traffic and make trips faster than they would otherwise have been. That will also save a lot of gas which will reduce pollution and terrible air.

But the big question now is: where does it all go from here? Are there any opportunities left? After all, all the big companies are in on the game so it's going to be difficult to get into it now when they have such a huge lead. What opportunities are there left and is there something a startup can do that the big companies are not doing now, or ever?

It seems to me that so far the approaches to self-driving vehicles have been very simple-minded. Sure, the software basis for these vehicles is indeed very complex. But so far, as far I can see, the social framework in which these vehicles will operate has been pretty much unchanged.

The assumption seems to have been that the cars will drive themselves but nothing else will change. I think there are far richer approaches and that these will be the areas of real potential for startups and more advanced technologies.

I can see two areas for approaching the future directions of self-driving vehicles. These are:

- Conventional self-driving vehicles (i.e. a car just like those we use at present, the only difference being that it drives itself)
- Nonconventional vehicles (i.e. vehicles that are unlike current autos that still provide transportation for people on a self-driving basis)

Conventional Vehicles that Are Self-Driving

I think there are two areas that will emerge for self-driving autos. These are the physical and social design of the auto.

Right now it seems to be assumed that a car will be the same if it is self-driving or not. But once you don't need a driver the physical design of the auto can change completely.

It doesn't need to look at all like a car now and the interior can be completely different, maybe like the room of a house. Maybe passengers can sit backwards, protected by new types of safety devices in case of a crash. Maybe there can be two or more floors. Maybe this can be like an apartment or an artist's studio. We are only limited by our imagination.

However I think that a more radical issue is the social design for the auto. We can think of an auto as being networked with other vehicles so that it can be part of an auto group or community. These auto collectives can aggregate themselves into groups such as a road train, a road party, a road team, or a road band.

Each of these groupings will mean a different role for a group. Maybe it can be a tour group, an emergency help group, a professional group such as a ski group or a study group. The group can be temporary such as a convoy or group tour, or permanent such as a family or neighborhood group.

All the autos in the group will be networked through apps that confer different roles on an auto so that it can play its part as a productive and creative member of that group. In this conception the auto becomes a vital player with a vital role, with the auto software being designed for that

particular role. My auto can be a designed driver, if you drink too much. This other auto can be a medical support auto. This other car can be the community center.

This isn't all by a long shot. Each auto can send out signals to other autos and receive signals in return. These signals could be electronic or visual telling other cars what it would is seeking and how they can participate.

So maybe the car can display signals to other drivers that it is seeking friends, or a member of its group. Maybe it could signal that the occupant is single and is open to finding other romantic friends. So the auto can become a moving matchmaking app.

In this concept, the auto can enter into different types of relationships with other autos. Those relationships could be personal or professional, literary or sporting, and so on. The auto now becomes a part of an online community where an auto knows it's possible to meet the occupants of other cars because they will usually be in the same vicinity. If they aren't, it can tell them to meet it somewhere at a particular time.

So this means that we can expand the types of approaches to self-driving autos to ones that cover their social and interpersonal role. The software and apps will confer a type of auto personality on the self-driving car. It maybe that its design will need to change with the personality of the car. This will leave a huge amount of potential types of vehicle for different startups that want to revolutionize this area.

That means you could buy cars with different personalities. Friendly ones. Studious ones. Brave ones. Aggressive ones, maybe for the young guys out for a little friendly fight.

Non-Conventional Vehicles That Are Self-Driving

Here's my take on the issue. Chinese cities have two massive problems, namely congestion and pollution. The congestion is from cars and trucks and the pollution is partly from cars and trucks. If we use self-driving cars, won't that make the problem worse?

Not if we think outside the box. How about self-driving personal transportation? By personal transportation I mean things like bicycles. You might think that self-driving bicycles are a stupid idea. After all, how can they drive themselves, even if they have an electric engine?

Before we answer that question, let's think of the new forms of personal transport that are just emerging. Have you heard of the Segway, the two-wheeled personal transporter? Just step onto them and they can take you anywhere and self-driving wouldn't be a problem for them.

But now there's a new class of personal transportation coming to town. These include electric hover boards, essentially electric skateboards. However the new versions of these don't require any skill at all to operate and maneuver. Again, just step onto them and off you go. Some of these have two wheels horizontally and some in-line likes a skateboard.

So why shouldn't you put a gyroscope onto a bicycle so that it can stay upright by itself also? Wouldn't that be a new form of transport? And it could also be self-driving too, once you give it a small computer with the same sort of software you have for a self-driving car.

So here's where I think self-driving is headed. If we could convert many drivers into personal transportation drivers with self-driving personal transportation, at one stroke we could massively reduce the problems of congestion and pollution. With a small hoverboard you could get to work quickly and avoid the congestion. At the same time your vehicle would cause no pollution.

Governments could ease this change by making it more expensive for cars to be on the road just as they are doing right now. The present efforts are not having too much impact but if the government set up special lanes just for electric bicycles and hover boards where traffic flowed very smoothly because it was all self-driving, people would get to work much more quickly and safely than if they were on conventional bicycles.

Let's thin more about this. If you have electric, self-driving personal transportation, then you have a lot of options that haven't currently been manufactured. Manufacturers such as BMW and Toyota have brought out some innovative personal vehicles in the last few years. These include, from Toyota, the three-wheeled motor-cycle and from BMW a motorcycle that has a cabin, to protect you from rain and snow and provide more protection in an accident.

So why can't inventors bring out new forms of personal and individual transportation that is small enough to be cheap to operate, but which offers self-driving capabilities so that safety is far higher and journeys are shorter and quicker? I think this offers a totally new avenue for development which would be encouraged by governments and supported by citizens who want radically less congestion and much cleaner and healthier environments?

Once you do this, there are other things you need to do. The software for self-driving personal transporters will be different in many ways from that for autos. For a start, self-driving personal transportation won't travel as fast, so the software needs to act differently. Accident prevention requires different strategies.

There's some hardware stuff to think about too. Some of the heavy sensors that are fine for autos will be too heavy for self-driving personal transporters so they will have to be redesigned and miniaturized for this different type of transportation.

New Hybrid Self-Driving Vehicles

Now we can imagine combining the two categories I have outlined above. That is mixing auto personalities with personal transporters. That means we can have personal transporters like hover boards with different social roles in different types of relationships. Each of these can change depending on the owners or occupant's personal, professional and social objectives and needs.

I think that once we start to think in the ways I have outlined in this article, other needs and possibilities will open up. Now we can mix particular auto and personal transporters with different types of environments, towns, cities and social goals and even individual personalities. A city that wants to expand medical research could have its own types of auto personalities and vehicles based on medical themes, such as exercise, fitness, nutrition, heart disease and so on.

This also opens up new possibilities to address social problems such as senior citizens who are lonely. These could have special apps to enable them to connect with other vehicles in their neighborhood for support and social connection. Cities can link in neighborhood community groups such as parents, dancers or health workers. So now the autos' function can be linked to addressing pressing social and personal issues which otherwise would be hard to address using conventional approaches.

In this way we can convert the idea of self-driving autos into a social and personal tool rather than just a technology. Then self-driving vehicles can be harnessed to solve social and emotional problems and issues. I think that's the way that our new entrepreneurs should be thinking.

Maybe my Yamaha FJ 1200 was just born too soon…

Dr. E. Ted Prince, the Founder and CEO of the Perth Leadership Institute, located in Florida in the US has also been CEO of several other companies, both public and private. He is the author of two books: "The Three Financial Styles of Very Successful Leaders" (McGraw-Hill, 2005) and "Business Personality and Leadership Success", Amazon Kindle 2011 as well as numerous other publications in this area. He is a frequent speaker at industry conferences. He works with large corporations globally on leadership development programs and coaches senior executives and teams in the area of financial leadership. He has held the position of Visiting Professor at the University of Florida in the US in its Graduate Business School and is currently a Visiting Professor at the Shanghai University of Finance and Economics in China.