### A solution to the single-question crowd wisdom problem

1. Better wisdom from crowds：麻省理工学院的学者们提出了一种新的方法来从群体中获取正确的答案。

人群的智慧(集体民主投票)不总是能选出正确的答案，但是现在已经找到了更好的方法。研究人员称之为“surprisingly popular”算法，以更好的从大量人群中提取正确的答案。这项调查被用于政治和经济预测，以及许多其他的集体活动。

新方法很简单：对于一个给定的问题，人们会问两件事，

1、他们认为正确的答案是什么

2、他们认为流行的观点会是什么。

两个集合反应之间的变化表明正确的答案

“In situations where there is enough information in the crowd to determine the correct answer to a question, that answer will be the one [that] most outperforms expectations,”

在人群中有足够的信息来确定一个问题的正确答案的情况下，答案将是最超出预期的答案

本文建立在理论和实证两方面。研究人员首先从数学上推导出他们的结果，然后通过一系列涉及到的学科，包括美国的州议会，一般的知识，皮肤科医生的医学诊断，以及艺术品拍卖估计，来评估他们在实践中是如何运作的。

The paper is built on both theoretical and empirical work. The researchers first derived their result mathematically, then assessed how it works in practice, through surveys spanning a range of subjects, including U.S. state capitols, general knowledge, medical diagnoses by dermatologists, and art auction estimates.

在所有这些领域，研究人员发现，与简单多数投票相比，“surprisingly popular”算法减少了21.3%的错误，比basic confidence-weighted votes 投票(人们在回答中表达了他们的自信程度)减少了24.2%。与另一种信任加权的投票相比，那些以最高平均置信水平回答问题的人，它减少了22.2%的错误，

Across all these areas, the researchers found that the “surprisingly popular” algorithm reduced errors by 21.3 percent compared to simple majority votes, and by 24.2 percent compared to basic confidence-weighted votes (where people express how confident they are in their answers). And it reduced errors by 22.2 percent compared to another kind of confidence-weighted votes, those taking the answers with the highest average confidence levels.

A capital idea一个好主意

为了了解该算法在实践中是如何工作的，考虑一个研究人员测试的案例。一群人被问了一个问题:费城是宾夕法尼亚州的首都吗?他们还被要求预测“yes”投票的流行程度。  
To see how the algorithm works in practice, consider a case the researchers tested. A group of people were asked a yes-or-no question: Is Philadelphia the capital of Pennsylvania? They were also asked to predict the prevalence of “yes” votes.

费城不是宾夕法尼亚州的首府; 正确的答案是哈里斯堡。但大多数人认为费城是首都，因为它是一个“历史意义重大的城市”。而且，错误地认为费城是宾夕法尼亚州的首府认为其他人会以同样的方式回答。所以他们预测，会有很高百分比的人的回答是“yes”。

Philadelphia is not the capital of Pennsylvania; the correct answer is Harrisburg. But most people believe Philadelphia is the capital because it is a “large, historically significant city.” Moreover, the people who mistakenly thought Philadelphia is the state capital largely thought other people would answer the same way. So they predicted that a very high percentage of people would answer “yes.”

同时，一定数量的受访者知道哈里斯堡是正确的答案。不过，其中很大一部分人也预计，许多其他人会错误地认为首都是费城。所以自己回答“不”的人仍然预计会有很高百分比的人的答案是“是”。

Meanwhile, a certain number of respondents knew that Harrisburg is the correct answer. However, a large portion of those people also anticipated that many other people would incorrectly think the capital is Philadelphia. So the people who themselves answered “no” still expected a very high percentage of “yes” answers.

这就是说这两个问题的答案 - 费城是首都吗？别人会这么想吗？ - 分歧。几乎所有人都希望别人回答“是的”，但回答“是”的人的实际比例明显较低。**因此，“否”的答案是““surprisingly popular”答案，因为它偏离了对答案的期望**。

That means the answer to the two questions — Is Philadelphia the capital? Will other people think so? — diverged. Almost everyone expected other people to answer “yes.” But the actualpercentage of people who answered “yes” was significantly lower. For this reason, the “no” answer was the “surprisingly popular” one, since it deviated from expectations of what the answer would be.

而且由于“surprisingly popular”答案在“否”方向上有所不同，那就告诉我们正确答案：不，费城不是首都。

And since the “surprisingly popular” answer differed in the “no” direction, that tells us the correct answer: No, Philadelphia is not the capital.

无论哪个方向的反应偏离预期，同样的原则也适用。当有人问哥伦比亚是否是南卡罗来纳州的首府时，相反的事情发生了：与他们期望有多少人会说“是”对比，更多的人回答“是的”，所以surprisingly popular”的答案是，正确的：哥伦比亚是首都。

The same principle applies no matter which direction responses deviate from expectations. When people were asked if Columbia is the capital of South Carolina, the opposite happened: More people answered “yes,” compared to their expectations of how many people would say “yes.” So the surprisingly popular answer was, correctly: Yes, Columbia is the capital.

**The wisdom of subsets of crowds人群的智慧**

在这个意义上，“surprisingly popular”原则不仅仅来源于人群的智慧。相反，它使用较大群众中知情人群的知识作为诊断上有力的工具，指出了正确的答案。

In this sense, the “surprisingly popular” principle is not simply derived from the wisdom of crowds. Instead, it uses the knowledge of a well-informed subgroup of people within the larger crowd as a diagnostically powerful tool that points to the right answer.

McCoy解释说：“很多人群智慧使人平等。“但有些人有更多的专业知识。”而那些人 - 如果他们有正确的信息和正确的公众感觉，就会产生很大的影响。

“A lot of crowd wisdom weights people equally,” McCoy explains. “But some people have more specialized knowledge.” And those people — if they have both correct information and a correct sense of public perception — make a big difference.

这是研究人员测试的情景。考虑艺术 研究人员要求艺术专业人士猜测不同当代艺术作品的价格范围。个别地，艺术专家选择的价格范围通常太低，这可能是因为对于一件专家不认识的艺术品，选择较低的范围是一个合理的、安全的答案。总而言之，这使得专家小组的多数意见更偏向于低价格的方向。

This is the case across scenarios that the researchers tested. Consider art. The researchers asked art professionals to guess the price range for different contemporary artworks. Individually, art experts selected price ranges that were typically too low, perhaps because selecting a lower range is a reasonable, safe answer for an artwork that the expert does not recognize. Collectively, this makes the majority opinion of an expert panel even more biased in the direction of low prices.

这是“surprisingly popular”原则有所作为的地方，因为它不取决于绝对多数的专家意见。相反，假设相对较少的专家认为一件售价为10万美元，同时预计大多数其他人会认为其销售量较少。在这种情况下，对这些专家的评估将导致“surprisingly popular”答案是，艺术品比大多数人认为的更昂贵。

And this is where the “surprisingly popular” principle makes a difference, since it does not depend on an absolute majority of expert opinion. Instead, suppose a relatively small number of experts believe a piece sold for $100,000, while anticipating that most other people will think it sold for less. In that case, the evaluations of those experts will lead the “surprisingly popular” answer to be that the artwork was more expensive than most people thought.

“本文中的论点，从粗略的意义上说，预计在少数人中的人们应该受到一些额外的关注，”Prelec说。那些希望成为少数派的人应该得到额外的关注

“The argument in this paper, in a very rough sense, is that people who expect to be in the minority deserve some extra attention,” Prelec says.

**Recovering truth 恢复真相**

学者们认识到，“surprisingly popular”算法在实践中并非万无一失。至少可以想象，人们可以预见到一个“surprisingly popular”意见，并尝试颠覆它，虽然这将很难执行。在“ 自然 ” 杂志上也写道：“这些说法是理论上的，不能保证在实践中取得成功，因为实际的受访者达不到理想。”

The scholars recognize that the “surprisingly popular” algorithm is not theoretically foolproof in practice. It is at least conceivable that people could anticipate a “surprisingly popular” opinion and try to subvert it, although that would be very hard to execute. It is also the case, as they write in the Nature paper, that “These claims are theoretical and do not guarantee success in practice, as actual respondents will fall short of ideal.”

研究集体智慧问题的其他学者认为，这种方法是有价值的。读过这篇文章的鹿特丹伊拉斯姆斯大学经济学教授Aurelien Baillon认为这是一个“令人兴奋的”结果，“开辟了全新的方式来思考一个老问题”。Baillon发现这篇论文有说服力，他补充说，因为它包含了理论论点和实证证据，证明它运行良好。”

Other scholars who have studied collective-wisdom problems believe the method is valuable. Aurelien Baillon, a professor of economics at Erasmus University in Rotterdam, who has read the paper, calls it an “exciting” result that “opens up completely new ways to think about an old problem.” Baillon finds the paper persuasive, he adds, because it contains both theoretical arguments “and empirical evidence that it works well.”

Baillon确实注意到，理论上，人们如何得出关于他人信仰的结论的问题仍然可以进一步探索。他观察到方法中的一个潜在的实际陷阱：有种可能调查中的所有参与者对别人的想法没有有用的了解，如果给出两个选择，则可以随机选择。Baillon观察到的这样一个50/50的分裂意味着“surprisingly popular”答案简单来说就是多数结果。  。

Baillon does note that the question of how people reach conclusions about the beliefs of others “can still be further explored” theoretically. And he observes one potential practical pitfall in the method: the possibility that all participants in a survey do not have useful knowledge about what others think, and make a random choice if given two options. Such a 50/50 split, Baillon observes, means the “surprisingly popular” answer would simply be the majority result.

不过，研究人员本人希望他们的工作将在各种环境下进行测试。在这篇文章中，他们表示相信，“surprisingly popular”原则将证明是持久的，断言：“即使传统的投票方法失败，这种知识也可以被利用来恢复真相。

Still, the researchers themselves hope their work will be tested in a variety of settings. In the paper they express confidence that the “surprisingly popular” principle will prove durable, asserting: “Such knowledge can be exploited to recover truth even when traditional voting methods fail.”