

The Climate Collaboratorium: Harnessing Collective Intelligence to Address Climate Change Issues

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The Challenge

Global climate change, caused by human-generated greenhouse-gas emissions, is perhaps the most pressing and important problem currently facing humanity. It is also unique by virtue of being a truly *systemic* problem of vast complexity: it affects every one of us, and is directly affected by every one of our actions. Like nothing else, dealing with climate change calls upon us to engage in effective collective decision making on a global scale.

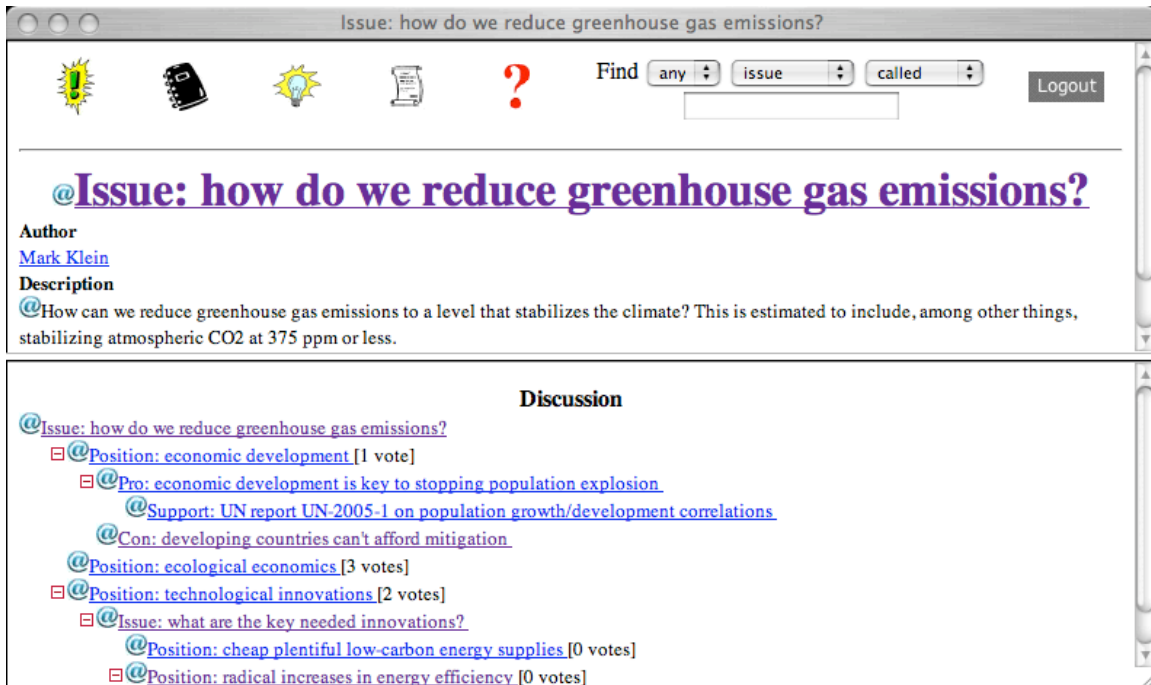
The spectacular emergence of the Internet and associated information technology has enabled unprecedented opportunities for such interactions, via email, instant messaging, news groups, chat rooms, blogs, wikis, podcasts, and the like. Using such technologies, it is now feasible to draw together knowledgeable and interested individuals, data bases, analytic tools, and so on, on a scale that was impossible a few short years ago. To date, however, such interactions have been incoherent and dispersed, contributions vary widely in quality, and there has been no clear way to converge on well-supported decisions concerning what actions, both grand and ground-level, humanity should take to solve their most pressing problems.

Our Approach

The idea described here is based on the belief that we can do better, that it is possible to harness computer technology to enable "collective intelligence" - i.e. the synergistic and cumulative channeling of the vast human and technical resources now available over the internet - in the service of addressing systemic problems like climate change.

Our approach is to develop a new class of web-mediated discussion and decision making forum which we call the "Collaboratorium". This system will use an innovative combination of internet-mediated interaction, collectively generated idea repositories, computer simulation, and explicit representation of argumentation to help large, diverse, and geographically-dispersed groups systematically explore, evaluate, and come to decisions concerning systemic challenges. Users will be able to share ideas, raise issues, specify options for these issues, analyze these options using simulation tools, discuss the relative merits of different options, and converge on collective decisions concerning which options to adopt. Tools for registering endorsements, maintaining reputation information, and identifying well-reasoned lines of argument will help users separate the wheat from the chaff.

The following screenshot from an early prototype shows, for example, how a group of users can collectively represent the arguments related to a single issue. Users can examine the current positions and arguments, vote for the positions they prefer, create new positions, and add argumentation concerning the pros and cons of the positions that have been captured:



The system will also enable access to analytic tools, including computer simulations, that embody the relationships among factors like demographics, economic activity, government policies, greenhouse gas emissions, and climate changes. Users will be able to posit and argue about possible values for the simulation parameters e.g. they will be able to posit that the birth rate by 2015 will fall to 10 per 1000 persons, or that a global carbon tax of \$60 per ton of CO₂ will be implemented in 2010. The parameter values that the users converge on can then be analyzed, using the appropriate simulations, to infer the outcomes - good or bad - that they lead to. This direct linkage between argumentation and analysis will enable groups to reach better-grounded collective decisions than either argumentation or simulation alone.

The potential benefits of applying this kind of technology are significant:

- improved collective **definition** – cumulative creativity to define the space of issues and options
- improved collective **search** – collective wisdom to intelligently explore this very large search space of possible ideas to find the most promising combinations
- improved collective **evaluation** - systematic representation of arguments for and against different options, using simulation tools, interaction protocols, and incentive mechanisms to increase the salience of contributions based on well-founded evidence and analysis
- improved collective **decision making** – decision analysis tools to identify the preferred aggregate options given the pattern of support for different decision alternatives
- unprecedented web-enabled **scale** and **open-ness**

The overall result can be characterized as electronic democracy on steroids, going beyond the realm of all-too-often emotionally-driven yes/no votes about small numbers of simplified alternatives towards enabling reasoned collective decision-making about highly complex issues.

Proposed Work

An initial version of the Collaboratorium system, which captures discussions as well-structured networks of issues, positions, and arguments, has already been developed. The primary focus of the proposed project will be to significantly extend and apply this system in the context of climate change issues.

One element of our work will involve creating open contests, wherein self-organized teams compete to develop effective, innovative and well-founded proposals concerning how to reduce global greenhouse gas emissions. We envision contests, for example, where teams are asked to develop policy scenarios (defined in terms of simulation parameters), demonstrate the policy impacts using simulations, and provide detailed rationales for the assumptions underlying the scenarios. The teams will be judged by independent experts (and perhaps also by other players) on the basis of (1) how attractive the scenario outcomes are, and (2) how plausible are the underlying assumptions. Teams will be thereby driven to consider such possibilities as: will we become a society based on public transport, will we telecommute from self-sufficient towns rather than physically commute from vast suburbs, will we move from huge centralized power-plants to distributed micro-generation, how will we align our society along the changes that need to be made, given our nations' industrial interests and ideological diversity? This will be a fundamentally multi-disciplinary discussion, requiring contributions from people with expertise in energy and transportation technology, economics, public policy, corporate governance, and so on. The contest participants will thus help us develop a better sense of whether a better future is possible by virtue of helping to design it.

Making this all work will involve technological innovations (e.g. reputation mechanisms, group voting systems, tools for identifying well-structured arguments, integrating simulations with argumentation systems), careful design of the rules of community interaction, and the creation of a committed community of contributors and expert judges. We will also probably need to "seed" the Collaboratorium with an initial corpus of policy options and pointers to relevant analytic tools. We have already identified an initial set of such tools including models, developed at MIT, for assessing the greenhouse gas and climate consequences of policy options such as carbon taxes and emissions trading.

Conclusion

If there ever was a challenge that calls for the application of collective intelligence, climate change is it. We believe that, building upon the foundation of the Internet, it is now becoming possible to harness the collective intelligence of thousands of people around the world to address this and other critical systemic problems. We hope the work proposed here will help achieve just that.