POST

Releasing Schrodinger's Cat into the Environment

May 20, 2020

Environmental Optimization Problems using Quantum Computing and Artificial Intelligence----EnviroAI

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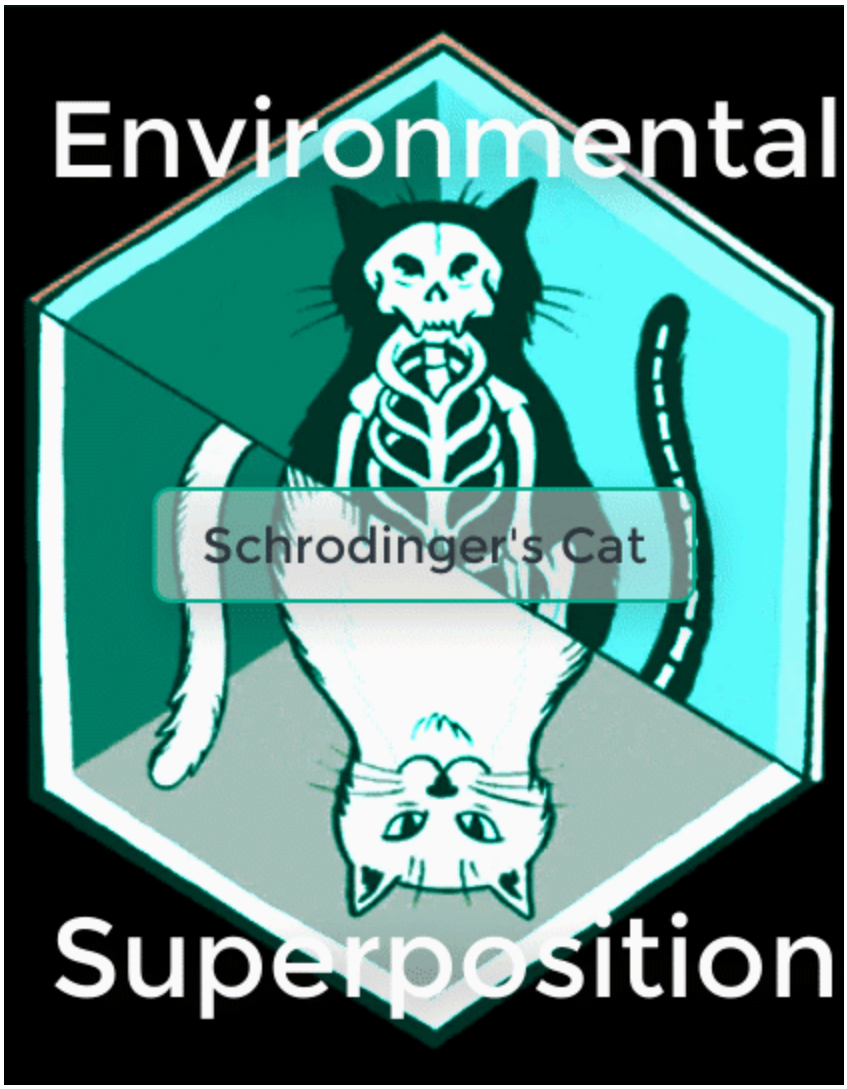
The Wall Street Journal yesterday (http://r20.rs6.net/tn.jsp?f=001kesQ9bUKC96MgKqEvzId87SgZh4H-OEHe4AlP4kLVLI7rRE_LF0unhkN_p0swhZiGF6kn9nMPlwHdVTI2QMP7GsbEcmHZIfXJRUdjwx09UWfd30L6HElJW6Ge5QHjCNiag8ELW0qrVSrRIey7BOCFBFWumVMlpgCWLysqWJZsytFITr_Xf5Ce2xeqA2w68l-xnyPvnsx25qJQMjQZXVFNf6lWfunAhXJ0zX16YOhgQF6o_ipvLCL_g==&c=&ch=) reported on the use of Microsoft’s quantum computing service by Toyota and Jij to solve traffic optimization problems in Japan. According to WSJ, “The companies found that quantum algorithms running on traditional computers could reduce waiting time for drivers stopped at red lights by about 20%, saving an average of about 5 seconds for each car, according to Jij.”

---“If you reduce waiting time at red lights in Houston by 20% …

you just reduced a lot of pollution.”

- Jed Anderson, Creator, EnviroAI



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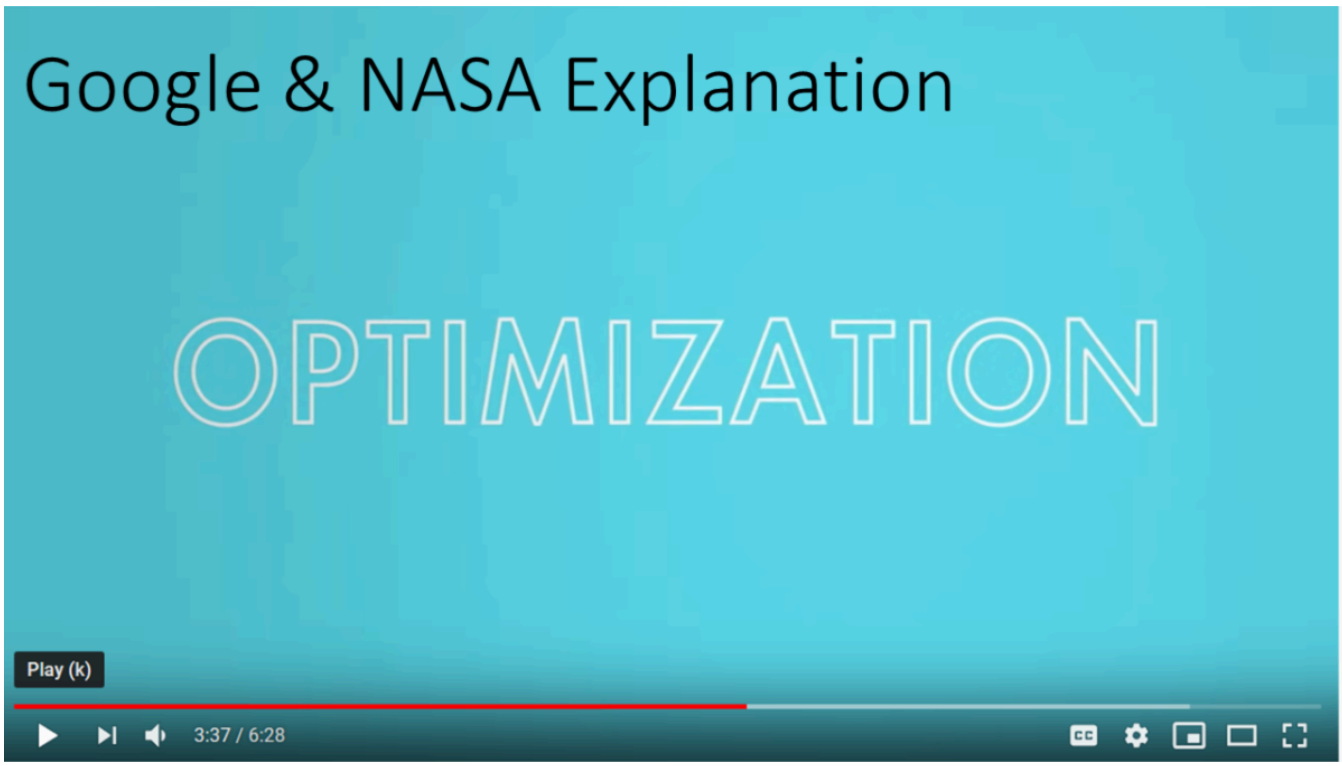
Quantum Optimization in Environmental Problem Solving

Explaining superposition (http://r20.rs6.net/tn.jsp?f=001kesQ9bUKC96MgKqEvzId87SgZh4H-OEHe4AlP4kLVLI7rRE_LF0unhkN_p0swhZiWDpJYV9HAVyW5G7GOm9xOMC_ftpirbEUwjuGOFBOAzRSiUyOT8c4z09Oef610bk_CZmZHDaESsi6O-hcD6Aqzp0Z18tiYsA64n4DqFy0hWbVA_WewoiQ-xh0s9IQUlVW&c=&ch=), Schrodinger's Cat (http://r20.rs6.net/tn.jsp?f=001kesQ9bU

KC96MgKqEvzId87SgZh4H-OEHe4AlP4kLVLI7rRE_LFounhkN_poswhZiVAkzjoop6E3xMJD2FaRfH1cvLjFEmMl2joohdoQ4bWUEhTtqwmO-Pukji7HP1TzMHtHj-J2X8tS7AgEFofSosO2deuouMXNjEEyKJ7FyKGmjB4_jhr6vtQ==&c=&ch=), and quantum physics (http://r20.rs6.net/tn.jsp?f=001kesQ9bUKC96MgKqEvzId87SgZh4H-OEHe4AlP4kLVLI7rRE_LFounhkN_poswhZifVpgBTADR8gvWnIgQ1CKce63_UQdbaLX6FlZvw73u5hI38yQOETUYzifh7UB61VBs8YV9n47N1E9_eaYOssd1pkVnKHSoy1D9INjiwknU_qqiEjSp-3saA==&c=&ch=) is beyond the scope of this email—nor could I explain them very well. The practical aspect I would like people to walk away with is the following. Understanding how things move in nature is essentially an optimization problem. It's NP-hard, but like the Traveling Salesman Problem (http://r20.rs6.net/tn.jsp?f=001kesQ9bUKC96MgKqEvzId87SgZh4H-OEHe4AlP4kLVLI7rRE_LFounhkN_poswhZiuKgMsytuVAwUTOIZ7IX7pbPvyCoFwsjSiIzNQpv2D70aIFuiM9X_UD7SN6qsKsQQQUfFkoKn9cWEI56vVdQDTh8TnZKzEUna&c=&ch=), it's quite solvable. Nature generally follows the simplest paths. We as humans also want to follow the simplest paths. And the great news for us is that the most significant benefit of quantum computing, and the thing that quantum computers are best at (http://r20.rs6.net/tn.jsp?f=001kesQ9bUKC96MgKqEvzId87SgZh4H-OEHe4AlP4kLVLI7rRE_LFounhkN_poswhZi3EAJKZWzuCod_wZQxXT_qmdIywn5VKCL33iViVTrzSUByxirw0dDRjurWH8UOCU2eKAPKpTQkzXTWI0-7tHKE3vkOdmfGcj7moXNGuxEjPXc0LV_O6qLEqmz2mHDlTW5s4DmRWSdeZomNQ1Nz_lQJA==&c=&ch=), is optimization problems. The reason is that quantum computers inherently compute or "think" differently. Quantum computers compute all solutions simultaneously or in parallel (http://r20.rs6.net/tn.jsp?f=001kesQ9bUKC96MgKqEvzId87SgZh4H-OEHe4AlP4kLVLI7rRE_LFounhkN_poswhZinieKOH5iMNL_ZHFRyucCJu74nBSOLokYtvCvPdJj24LYA-X6yVUVCfRtuxs4Bb3S5F_nIINNqEnsdOdmjIGa-u9zamKpqN2tghjJSUPWDJHS63GQ2YIbsYjhGpASPO10gN2zHiVQ5B_DxYBxgcyqrA==&c=&ch=) rather than sequentially and linearly. Classical computers solve problems linearly (i.e. 0110001001010). In quantum computing, a "zero" can be a "one" at the same time, and everything in

between a zero and a one at the same time, because of the superposition of quantum states (i.e. Schrodinger's Cat being both alive and dead until it is observed—the collapse of the wave function).



EnviroAI and Quantum/AI Technology

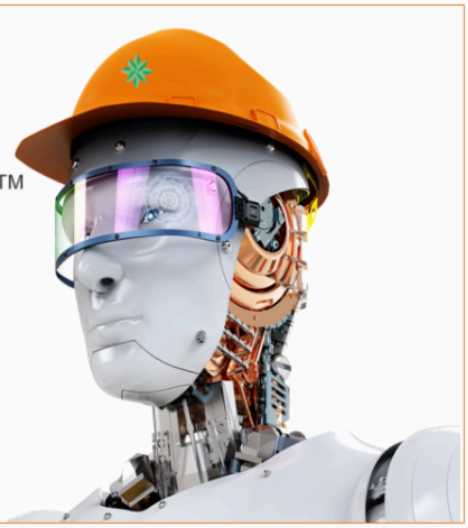
EnviroAI has acquired quantum computing time on D-Wave's quantum computer. Additional cloud-based quantum services are now available through Amazon (http://r20.rs6.net/tn.jsp?f=001kesQ9bUKC96MgKqEvzId87SgZh4H-OEHe4AlP4kLVLI7rRE_LF0unj7Leu-HMboHEYLhS-nX7snZK1wee7NrSpxFlWzEtGhoUP7unBMMeyJt32W-Zj2kWmljw36Uf9Pkd0G

RNVQq2aOuJ3E-D9vecgGwqCdyV43XP5P7GDUe70dR8KrS_GQNiB4E2NiQQvRnSBGiFGRX0BKPKuuU-0OPRhdSXnM_sMswePFmB4t0jZg=&c=&ch=), IBM (http://r20.rs6.net/tn.jsp?f=001kesQ9bUKC96MgKqEvzId87SgZh4H-OEHe4AlP4kLVLI7rRE_LF0unhkN_p0swhZi_emB2eZlU0iecSQIKV5EuDP3aSTxUDICrkI8Y1a4ZB5kvju-DfTsQLGp2j9rwXTBlNXcs9LdkWZMRi32EbUmYXLHhNYyyjjoxb9u-OXAmbWW1si4j4BorkRZbviGyEzyvYxzigaBiAVSHcytxrtME95uaH6CmqOeGzMfS5AuqtBHje7z83iyhDtk0tETT2mBBE8twwGWVtKvVxr8YsUUiyTQ8XucjFk61_th96ZBE1jSrn4x9n-QKHH2p1fIQQgAMIMgDI-Qw2nIu5nTcoH0ZsYPy0e33CrL6-sAPOc9XS3Smh4c5v-Nmm8NxSJP9tromF8f1eS6HOTwDQy9_E1o-Ys4Ch2zq6IWpwFVrFZ-RnQSvvCiGDvVhqSKskUqCoF3skxEVH8CjFtNUdDSBfclcZlVMRgqkn7zuLtaYM1jtddxPrzJNt6V1SQPu3JCRLxhi4yxGauzs4DMPc0JXEhEv92XQcWpDz_sKWRZEv39rlvDcskgrQC04gO9gnAwKa8hr9urzBBJy4f8jcjW1NIR-ss6NcIRHqovH8XlUyxj1R73kk4y3BnK_-05ZqfoP8GOAbBeFzFH9ca8NI30Ih7-wXjKoCUDT96CufidMFSyeWc3456xEobvag==&c=&ch=), and Microsoft (http://r20.rs6.net/tn.jsp?f=001kesQ9bUKC96MgKqEvzId87SgZh4H-OEHe4AlP4kLVLI7rRE_LF0unhkN_p0swhZiYnYUykrvqs8QU4d_NCap2UviTLBoz9JB3uXB_NpMG9YkhnfEyDc1zidkDKi2lhHRRX8XzugJQqu-LCoptTqtOKLHZOKK7mdVNjI_LtH6_yzEfbZe7jVN9yF2Tf9f-hUk&c=&ch=). As these computers and the software/algorithms to utilize these computers advance—EnviroAI, like the companies in the Wall Street Journal article mentioned above, will be looking to solve regulatory optimization problems and environmental optimization problems with these quantum computing advancements.

It's an incredible world we are living into.

Ceres AI™

Environmental A. I.



More Information on Ceres AI (http://r20.rs6.net/tn.jsp?f=001kesQ9bUKC96MgKqEvzId87SgZh4H-OEHe4AlP4kLVLI7rRE_LF0unoYdsWZPrCMh0-0OrlM4kXDuLPXEwNorR3u46UEA0DOdffIJDwOU3DDW5a4LTHIAsdAhzHVOLJ-ibW8GYR43va6JEMd60WFgqw==&c=&ch=)

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