

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**PGR2023-00039**

**DECLARATION OF DR. FENGQI YOU**

I, Fengqi You, declare as follows:

1. I have been retained on behalf of Upstream Data Inc. (“Upstream” or “Patent Owner” or “PO”) to offer technical opinions relating to U.S. Patent No. 11,574,372 (the “’372 patent”). I understand that the ’372 patent is subject to a petition by Crusoe Energy Systems, LLC (“Crusoe” or “Petitioner”) requesting the Patent Trial and Appeal Board (“PTAB” or “Board”) to institute a post-grant review (“PGR”).

2. I have been asked to provide my independent analysis of the ’372 patent, Crusoe’s PGR petition, the prior art cited therein and the arguments and analysis in the petition and declarations submitted by Crusoe, in particular the declarations by Dr. Michael Nikolaou (EX1003) and Mr. Vernon Kasdorf (EX1004) stating their opinions regarding the validity of the ’372 patent. For this declaration I was asked to focus on certain aspects of the petition and declarations, such as the motivation to combine and whether the prior art in the petition was substantially similar to prior art considered during ’372 patent prosecution. I also address patentability of the challenged claims under 35 U.S.C. § 101 and the related opinions by Nikolaou and Kasdorf.

3. My opinions in this declaration are made from the perspective of one of ordinary skill in the art at the time of the invention.

4. I am not and never have been an employee of Upstream. I received no compensation for this declaration beyond my normal hourly compensation for my time actually spent preparing this declaration, including analysis of the petition and materials cited therein. This compensation is not contingent on the nature of my findings or the outcome of this PGR or any other proceeding or litigation related to the '372 patent.

## **I. QUALIFICATIONS**

5. I am a Professor at Cornell University, where I also hold the Roxanne E. and Michael J. Zak Chair Professorship in the School of Chemical and Biomolecular Engineering. Within Cornell, I also serve as the Chair of Ph.D. Studies in Systems Engineering, Co-Director of the Cornell University AI for Science Institute, Co-Lead of the Schmidt AI in Science Program, and Co-Director of the Cornell Institute for Digital Agriculture. I also have teaching and research appointments in eight other engineering and science departments at Cornell University. These include Computer Science, Electrical and Computer Engineering, Operations Research and Information Engineering, Systems Engineering, Mechanical and Aerospace Engineering, Civil and Environmental Engineering, Applied Information Systems, and Applied Mathematics. I actively mentor over 30 graduate students across the aforementioned science and engineering departments, guiding them in their original research projects and

assisting with their dissertations. I also routinely supervise 5 post-doctoral scholars, in addition to dozens of undergraduate students.

6. I earned a Bachelor of Engineering degree in Chemical Engineering from Tsinghua University in Beijing, China, in 2005, followed by a PhD in Chemical Engineering with a concentration on Process Systems Engineering and Artificial Intelligence (AI) from Carnegie Mellon University in Pittsburgh, Pennsylvania, in 2009. Before joining Cornell University in 2016, I spent two years in the Mathematics and Computer Science Division at Argonne National Laboratory. I also served for five years at Northwestern University as an Assistant Professor of Chemical and Biological Engineering, and of Industrial Engineering and Management Sciences.

7. In my role as a Professor at Cornell University I teach both undergraduate and graduate courses and give guest lectures every year for the various engineering and science departments listed above. The courses and lectures cover a wide range of topics, ranging from chemical engineering, energy systems, process engineering, artificial intelligence (AI), renewable energy, sustainability, computational modeling, computer science and engineering, process design, industrial manufacturing, chemistry, physics, materials science and processing, biological engineering, life sciences, food and agriculture, climate, automation and

control, electrical and electronic engineering, quantum computing, infrastructure, transportation, buildings and architecture, among many others.

8. I have authored over 250 refereed articles in high-impact journals such as *Science*, *Nature Sustainability*, *Nature Communications*, *Science Advances*, and *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*. I have also published over 160 peer-reviewed conference proceedings, one book and authored nine book chapters on various aspects of science and engineering. Parts of my research have earned editorial highlights in *Science* and *Nature*, features on dozens of journal covers (e.g., *Energy & Environmental Science*, *Environmental Science & Technology*, *ACS Sustainable Chemistry & Engineering*, *AIChE Journal*, *Industrial & Engineering Chemistry Research*), and coverage in leading media outlets (e.g., *New York Times*, *BBC*, *Reuters*, *Washington Post*, *Wall Street Journal*, *Fortune*, *Daily Mail*, *Agence France-Presse*, *Bloomberg*, *Scientific American*, *Newsweek*, *BusinessWeek*, *Hill, Guardian*, *New Scientist*, *Popular Science*, and *National Geographic*). I serve as an editor of *Computers & Chemical Engineering*; associate editor of AAAS journal *Science Advances* and *IEEE Transactions on Control Systems Technology*; consulting editor of *AIChE Journal*; subject editor of *Advances in Applied Energy*; guest editor of *Energy*, *Journal of Cleaner Production*, and *Renewable & Sustainable Energy Reviews*; and is on the editorial boards of *ACS Sustainable*

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