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Bioinformatics – Eligibility Challenges for Inventions at the Intersection Of Biology and Software

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(Part 2 of a 2 Part Series)

The application of innovative data driven approaches such as bioinformatics and artificial intelligence to the life science sector has brought about a change in way that biological inventions can be protected by patent laws. This 4 Part Series examines eligibility challenges of filing and prosecution data driven innovations and provides practical tips for addressing some of these challenges.

Describe Improvements to the Functioning of the Computer Itself or Any Other Technology or Technical Field

- Identify specific industries or applications where the invention may be particularly useful and describe the inventions improvements relative to existing systems and processes in each industry or application.
 - Drafting the patent application requires a clear strategy that is reinforced by a technical understanding of the invention, as well as the industries or applications in which the invention operates. You need to be able to not only explain how the invention works at a detailed level, but also why the invention was conceived and why it improves upon existing systems and processes.
 - Perform a patentability search to make sure any technological improvement you identified is accurately defined, and to make sure you understand the technical contribution provided by the invention.
 - Describe in the patent application the technological problems associated with the existing systems and processes. Then, describe how the invention provides a technical solution to and improves upon the problems associated with the existing systems and processes. Be sure to reference specific claim recitations that cover the technological improvements. As you explain specific features/elements of the invention in the detailed description, reiterate the technological improvements achieved by each feature/element and explain how each feature/element operates to achieve the technological improvements.
- Describe any improvements to computer functionality achieved by the claimed invention—tracks well with a number of Federal Circuit cases. *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016); *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299 (Fed. Cir. 2016); *Visual Memory LLC v. NVIDIA Corp.*, 867 F.3d 1253 (Fed. Cir. 2017); *Data Engine Techs. LLC v. Google LLC*, 906 F.3d 999 (Fed. Cir. 2018);

Uniloc USA, Inc. v. LG Elecs. USA, Inc., 957 F.3d 1303 (Fed. Cir. 2020)).

- This can be done by providing in the specification a technical description of how the invention improves computer functionality and establishing a clear nexus between the claim language and the improvement to the computer functionality.
 - Pay particular attention to providing claim features targeted at the elements that provide the improvement. For example, integrate hardware or specialized computing devices that provide the improvement into the steps of the claims.
 - Avoid reciting the claim features at a high level or generic manner whereby the nexus is lost between the features and the improvement.
- For example, describe any improvements to the particular structure of a server or data storage device that stores data being used (e.g., reduced memory usage), a distributed network architecture (e.g., faster network communication), speed or efficiency of the underlying computing device, a user interface, security, model architecture (e.g., choice of a specific model for a particular hardware implementation which leads to an improvement to the functioning of the computer), training system (e.g., a data processor that augments training data in an automated manner), method of programming or designing software, etc.
- Be careful not to combine an inventions ability to improve computer functionality itself with a generic computers inherent ability to improve an abstract idea or fundamental practice. *Customedia Techs., LLC v. Dish Network Corp.*, 951 F.3d 1359 (Fed. Cir. 2020).
- Describe any improvements to another technology or technical field. *McRO, Inc.*, 837 F.3d 1299; *Amdocs (Isr.) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288 (Fed. Cir. 2016); *XY, LLC v. Trans Ova Genetics, LC*, 968 F.3d 1323 (Fed. Cir. 2020), *on remand to* No. 17-cv-00944-WJM-NYW, 2021 WL 5564664 (D. Colo. Nov. 29, 2021); *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1359 (Fed. Cir. 2020), *cert. denied*, 141 S. Ct. 1266 (2021).
 - As above, this can be done by providing in the specification a technical description of how the invention improves another technology or technical field and establishing a clear nexus between the claim language and the improvement to another technology or technical field.
 - In some instances, this may be done by describing how the invention improves another technology or technical field through a practical application of the algorithm recited in the claims.
 - Artificial intelligence and bioinformatic claims can be drafted with elements or combination of elements that reflect an improvement specific to artificial intelligence or bioinformatic technology.
 - For example, describe how the invention incorporates a traditional biotech process into a new domain space such as the Internet, how a computerized method can be used to operate a device in an improved manner, or used to generate new or improved data or improve upon the prior method, how an algorithm improves a technical field such as variant calling or prediction, improvements

made in methods for collecting training data or for using the collected data when training a model, reduction in a number of model parameters required, improving inference accuracy (not merely an improvement to the math that results in a better answer), enabling use of a larger corpus of training data, increasing training efficiency on a smaller corpus of data, etc.

[Link to Part 1 of this series.](#)