

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSARA INC.,
Petitioner

v.

MOTIVE TECHNOLOGIES, INC.,
Patent Owner

Case IPR2026-00108
U.S. Patent No. 12,062,243

DECLARATION OF SYLVIA D. HALL-ELLIS, PH.D.

Mail Stop "PATENT BOARD"
Patent Trial and Appeal Board
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Samsara EX1041
Samsara v. Motive
IPR2026-00108

I. INTRODUCTION

I, Sylvia D. Hall-Ellis, hereby declare:

1. I have been retained as an expert by Samsara Inc. (referred to herein as “Defendant”).

2. I have written this declaration at the request of Defendant to provide my expert opinion regarding the authenticity and public availability of four publications. My declaration sets forth my opinions in detail and provides the basis for my opinions regarding the public availability of these publications.

3. I reserve the right to supplement or amend my opinions, and bases for them, in response to any additional evidence, testimony, discovery, argument, and/or other additional information that may be provided to me after the date of this declaration.

4. I am being compensated for my time spent working on this matter at my normal consulting rate, plus reimbursement for any additional reasonable expenses. My compensation is not in any way tied to the content of this declaration, the substance of my opinions, or the outcome of this proceeding. I have no other interests in this proceeding or with any of the parties.

5. All of the materials that I considered are discussed explicitly in this declaration.

II. QUALIFICATIONS

6. I am currently an Adjunct Professor in the School of Information at San José State University. I obtained a Master of Library Science from the University of North Texas in 1972 and a Ph.D. in Library and Information Science from the University of Pittsburgh in 1985. Over the last fifty years, I have held various positions in the field of library and information resources. I was first employed as a librarian in 1966 and have been involved in the field of library sciences since, holding numerous positions.

7. I am a member of the American Library Association (“ALA”) and its Association for Library Collections & Technical Services (“ALCTS”) Division, and I served on the Committee on Cataloging: Resource and Description (which wrote the new cataloging rules) and as the chair of the Committee for Education and Training of Catalogers and the Competencies and Education for a Career in Cataloging Interest Group. I also served as the Chair of the ALCTS Division’s Task Force on Competencies and Education for a Career in Cataloging. Additionally, I served as the Chair for the ALA Office of Diversity’s Committee on Diversity, as a member of the REFORMA National Board of Directors, and as a member of the Editorial Board for the ALCTS premier cataloging journal, *Library Resources and Technical Services*, as a Co-Chair of the Membership Committee for the Library Research Round Table (LRRT) of the American Library

Association, and as a member of the LRRT Nominating Committee. Currently I serve as a Member of the CORE Margaret Mann Citation Committee and as a Member of the Member of the CORE Awards & Scholarship Coordination Committee.

8. I have also given over one-hundred presentations in the field, including several on library cataloging systems and Machine-Readable Cataloging (“MARC”) standards. My current research interests include library cataloging systems, metadata, and organization of electronic resources.

9. My full *curriculum vitae* is attached hereto as Attachment 5 to this declaration.

III. PRELIMINARIES

10. I am not an attorney and will not offer opinions on the law. I am, however, rendering my expert opinion on the authenticity of the document referenced herein and on when and how each document was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, could have located the document.

11. I understand that an item is considered authentic if there is sufficient evidence to support a finding that the item is what it is claimed to be. I also understand that authenticity can be established based on the contents of the

documents themselves, such as the appearance, contents, substance, internal patterns, or other distinctive characteristics of the item, taken together with all of the circumstances. I further understand that an item is considered authentic if it is at least 20 years old, in a condition that creates no suspicion of its authenticity, and in a place where, if authentic, it would likely be. Lastly, I understand that a document's authenticity can be established by comparison with an authentic specimen.

12. I understand that a printed publication qualifies as publicly accessible as of the date it was disseminated or otherwise made available such that a person interested in and ordinarily skilled in the relevant subject matter could locate it through the exercise of reasonable diligence.

13. While I understand that the determination of public accessibility under the foregoing standard rests on a case-by-case analysis of the facts particular to an individual publication, I also understand that a printed publication may be rendered "publicly accessible" if it is cataloged and indexed by a library such that a person interested in the relevant subject matter, exercising reasonable diligence, could locate it (i.e., I understand that cataloging and indexing by a library may show public accessibility, though there are other ways that a printed publication may qualify as publicly accessible). I understand that the cataloging and indexing by a single library, even in a foreign country, of a single instance of a particular printed

publication may show public accessibility. I understand that, even if access to a library is restricted, a printed publication that has been cataloged and indexed therein may be publicly accessible so long as a presumption is raised that the portion of the public concerned with the relevant subject matter would know of the printed publication. I also understand that the cataloging and indexing of information that would guide a person interested in the relevant subject matter to the printed publication, such as the cataloging and indexing of an abstract for the printed publication, can show public accessibility.

14. I understand that routine business practices, such as general library cataloging and indexing practices, can be used to establish an approximate date on which a printed publication became publicly accessible.

IV. INDEXING AND PUBLIC AVAILABILITY

15. Based on my experience working in research libraries, it is my opinion that members of the public would have been able to locate the material discussed herein on their own or with the assistance of a research librarian with relative ease using the tools and resources described herein.

16. A researcher may discover material relevant to his or her topic in a variety of ways. One common means of discovery is to search for relevant information in an index of periodical and other publications. Having found relevant material, the researcher will then normally obtain it online, look for it in

libraries, or purchase it from the publisher, a bookstore, a document delivery service, or other provider. Sometimes, the date of a document's public accessibility will involve both indexing and library date information. However, date information for indexing entries is often unavailable. This is especially true for online indices.

17. Indexing services use a wide variety of controlled vocabularies to provide subject access and other means of discovering the content of documents. The formats in which these access terms are presented vary from service to service.

18. Before the widespread development of online databases to index articles in journals, magazines, conference papers, and technical declarations, libraries purchased printed volumes of indices. Graduate library school education mandated that students learn about the bibliographic control of disciplines, the prominent indexing volumes, and searching strategies required to use them effectively and efficiently. Half of the courses that I studied in library school were focused on the bibliography and resources in academic disciplines.

19. Librarians consulted with information seekers to verify citations, check availability in union catalogs, printed books catalogs, and the OCLC database, and make formal requests for materials, *e.g.*, books, conference proceedings, journal articles. Requests were transmitted using Telex machines, rudimentary email systems, and the United States Postal Service. During my

career, I have performed and supervised staff who handled these resource sharing tasks.

V. RELEVANT BACKGROUND TO MY OPINIONS

20. I am not an attorney and will not offer opinions on the law. I am, however, rendering my expert opinion on the authenticity of the documents referenced herein and on when and how each of these documents was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising ordinary diligence, could have located the document prior to June 15, 2021.

21. I am informed by counsel that a printed publication qualifies as publicly accessible as of the date it was disseminated or otherwise made available such that a person interested in and ordinarily skilled in the relevant subject matter could locate it through the exercise of ordinary diligence.

22. While I understand that the determination of public accessibility under the foregoing standard rests on a case-by-case analysis of the facts particular to an individual publication, I also understand that a printed publication is rendered “publicly accessible” if it is cataloged and indexed by a library such that a person interested in the relevant subject matter could locate it (i.e., I understand that cataloging and indexing by a library is sufficient, though there are other ways that a printed publication may qualify as publicly accessible). One manner of sufficient

indexing is indexing according to subject matter category. I understand that the cataloging and indexing by a single library of a single instance of a particular printed publication is sufficient, even if the single library is in a foreign country. I understand that, even if access to a library is restricted, a printed publication that has been cataloged and indexed therein is publicly accessible so long as a presumption is raised that the portion of the public concerned with the relevant subject matter would know of the printed publication. I also understand that the cataloging and indexing of information that would guide a person interested in the relevant subject matter to the printed publication, such as the cataloging and indexing of an abstract for the printed publication, is sufficient to render the printed publication publicly accessible.

23. I understand that routine business practices, such as general library cataloging and indexing practices, can be used to establish an approximate date on which a printed publication became publicly accessible.

24. I am told by counsel that the subject matter of this proceeding relates to computer/machine vision, machine-learning (including neural-network) methods, and classical machine/computer vision algorithms.

25. I have been informed by counsel that a “person of ordinary skill in the art at the time of the invention” (“POSITA”) is a hypothetical person who is presumed to be familiar with the relevant field and its literature at the time of the

invention. This hypothetical person is also a person of ordinary creativity, capable of understanding the scientific principles applicable to the pertinent field.

26. I am told by counsel that, for the subject matter identified as above, a POSITA would possess a bachelor's in computer science with a focus on computer/machine vision, and at least two years of experience with each of: (1) machine-learning (including neural-network) methods as applied to machine/computer vision and (2) classical machine/computer vision algorithms (e.g., R-CNN, Mask R-CNN, Fast R-CNN, and SSD). I have been further informed by counsel that a person of ordinary skill in the art would have been familiar with and able to understand the information known in the art relating to these fields, including the publications discussed in this declaration.

27. With respect to the person of ordinary skill in the art identified above, it is my opinion that such a person would have been engaged in research, learning, study, and practice in the field, and formal instruction so that bibliographic resources relevant to his or her research would be familiar. Prior to June 15, 2021, such a person would have had access to a vast array of long-established print resources in website design and development as well as to a rich set of online resources providing indexing information, abstracts, and full text services.

28. In preparing this declaration, I used authoritative databases, such as the OCLC bibliographic database, the Library of Congress Online Catalog, and the

Library of Congress Subject Authorities, to confirm citation details of the various publications discussed. Unless I note otherwise below in reference to a specific serial publication, it is my expert opinion that this standard protocol was followed for the serial publications discussed below.

29. *Indexing.* A researcher may discover material relevant to his or her topic in a variety of ways. One common means of discovery is to search for relevant information in an index of periodicals and other publications. Having found relevant material, the researcher will then normally obtain it online, look for it in libraries, or purchase it from a publisher, a bookstore, a document delivery service, or other provider. Sometimes, the date of a document's public accessibility will involve both indexing and library date information. However, date information for indexing entries is often unavailable. This is especially true for online indices.

30. Indexing services use a wide variety of controlled vocabularies to provide subject access and other means of discovering the content of documents. The Library of Congress Subject Authorities includes standard forms of terms and cross references that are included in bibliographic records. Subject headings are terms that an individual seeking a document regardless of format can enter in the search bar of the online catalog. Subjects also connect an authenticated term (one included in the Library of Congress subject headings list) with related, broader,

and narrower terms. The formats in which these access terms are presented vary from service to service.

31. Online indexing services commonly provide bibliographic information, abstracts, and full-text copies of the indexed publications, along with a list of the documents cited in the indexed publication. These services also often provide lists of publications that cite a given document. A citation of a document is evidence that the document was publicly available and in use by researchers no later than the publication date of the citing document. Prominent indexing services include the *IEEE Xplore* database, the *ACM Digital Library*, and the digital repositories *ResearchGate* and *Semantic Scholar*.

32. *MARC Standard*. I am fully familiar with the library cataloging standard known as the MARC standard, which is an industry-wide standard method of storing and organizing library catalog information.¹ MARC was first developed in the 1960's by the Library of Congress. A MARC-compatible library is one that has a catalog consisting of individual MARC records for each of its items. Today, MARC is the primary communications protocol for the transfer and storage of bibliographic metadata in libraries.²

¹ The full text of the standard is available from the Library of Congress at <http://www.loc.gov/marc/bibliographic/> (last visited September 29, 2025).

² Almost every major library in the world is MARC-compatible. *See, e.g., MARC Frequently Asked Questions (FAQ)*, Library of Congress,

33. Since at least the early 1970s and continuing to the present day, MARC has been the primary communications protocol for the transfer and storage of bibliographic metadata in libraries.³ As explained by the Library of Congress:

You could devise your own method of organizing the bibliographic information, but you would be isolating your library, limiting its options, and creating much more work for yourself. Using the MARC standard prevents duplication of work and allows libraries to better share bibliographic resources. Choosing to use MARC enables libraries to acquire cataloging data that is predictable and reliable. If a library were to develop a “home-grown” system that did not use MARC records, it would not be taking advantage of an industry-wide standard whose primary purpose is to foster communication of information.

<https://www.loc.gov/marc/faq.html> (last visited September 29, 2025) (“MARC is the acronym for Machine-Readable Cataloging. It defines a data format that emerged from a Library of Congress-led initiative that began nearly fifty years ago. It provides the mechanism by which computers exchange, use, and interpret bibliographic information, and its data elements make up the foundation of most library catalogs used today.”). MARC is the ANSI/NISO Z39.2-1994 (reaffirmed 2016) standard for Information Interchange Format.

³ A complete history of the development of MARC can be found in *MARC: Its History and Implications* by Henrietta D. Avram (Washington, DC: Library of Congress, 1975) and available online from the Hathi Trust (<https://babel.hathitrust.org/cgi/pt?id=mdp.39015034388556;view=1up;seq=1>; last visited September 29, 2025).

Using the MARC standard also enables libraries to make use of commercially available library automation systems to manage library operations. Many systems are available for libraries of all sizes and are designed to work with the MARC format. Systems are maintained and improved by the vendor so that libraries can benefit from the latest advances in computer technology. The MARC standard also allows libraries to replace one system with another with the assurance that their data will still be compatible. *Why Is a MARC Record Necessary?* LIBRARY OF CONGRESS.⁴

34. Thus, almost every major library in the world is MARC-compatible. *See, e.g., MARC Frequently Asked Questions (FAQ)*, LIBRARY OF CONGRESS.⁵ (“MARC is the acronym for MACHine-Readable Cataloging. It defines a data format that emerged from a Library of Congress-led initiative that began fifty years ago. It provides the mechanism by which computers exchange, use, and interpret bibliographic information, and its data elements make up the foundation of most library catalogs used today.”). MARC is the ANSI/NISO Z39.2-1994 standard

⁴ <http://www.loc.gov/marc/umb/um01to06.html#part2>

⁵ <https://www.loc.gov/marc/faq.html>

(reaffirmed in 2016) for Information Interchange Format. The full text of the standard is available from the Library of Congress.⁶

35. A MARC record comprises several fields, each of which contains specific data about the work. Each field is identified by a standardized, unique, three-digit code corresponding to the type of data that follow. For example, a work's title is recorded in Field 245; the primary author of the work is transcribed in Field 100; an item's International Standard Book Number ("ISBN") consisting of ten or thirteen digits is transcribed in Field 020; an item's International Standard Serial Number ("ISSN") is transcribed in Field 022; the Library of Congress classification notation is recorded in Field 050; and the publication date is recorded in Field 260 under the subfield "c." If a work is a periodical, then its publication frequency is recorded in Field 310, and the publication dates (e.g., the first and last publication) are recorded in Field 362, which is also referred to as the enumeration/chronology field.⁷

36. The library that created the record is recorded in Field 040 in subfield "a" with a unique library code. In order to determine the name of the library where the MARC record was created, I consulted the Directory of OCLC Libraries to

⁶ <http://www.loc.gov/marc/bibliographic/>

⁷ <http://www.loc.gov/marc/bibliographic/bd3xx.html>

identify the institution that created the MARC record.⁸ When a participating OCLC library uses a MARC record created by another organization, the designation for the second user appears as a three-digit code in Field 049 with a “holding library” location as the fourth character.

37. MARC records also include several fields that include subject matter classification information. An overview of MARC record fields is available through the Library of Congress.⁹ For example, 6XX fields are termed “Subject Access Fields.”¹⁰ Among these, for example, is the 650 field; this is the “Subject Added Entry – Topical Term” field.¹¹ The 650 field is a “[s]ubject added entry in which the entry element is a topical term.” These entries “are assigned to a bibliographic record to provide access according to generally accepted thesaurus-building rules (e.g., *Library of Congress Subject Headings* (LCSH), *Medical Subject Headings* (MeSH)).” *Id.* Further, MARC records include call numbers, which themselves include a classification number. For example, the 050 field is the “Library of Congress Call Number.”¹² A defined portion of the Library of Congress Call (LCC) Number is the classification number, and “source of the

⁸ <https://www.oclc.org/en/contacts/libraries.html>

⁹ <http://www.loc.gov/marc/bibliographic/>

¹⁰ <http://www.loc.gov/marc/bibliographic/bd6xx.html>

¹¹ <http://www.loc.gov/marc/bibliographic/bd650.html>

¹² <http://www.loc.gov/marc/bibliographic/bd050.html>

classification number is *Library of Congress Classification* and the *LC Classification-Additions and Changes*.” Thus, included in the 050 field is a subject matter classification. Further, the 082 field is the “Dewey Decimal Call Number.”¹³ A defined portion of the Dewey Decimal Call (DDC) Number is the classification number, and “source of the classification number is the *Dewey Decimal Classification and Relative Index*.” Thus, included in the 082 field is a subject matter classification. Each item in a library has a single classification number. A library selects a classification scheme (e.g., the Library of Congress classification scheme just described or a similar scheme such as the Dewey Decimal classification scheme) and uses it consistently. When the Library of Congress assigns the LCC classification number, it appears as part of the 050 field. When the Library of Congress assigns the DDC classification number, it appears as part of the 082 field. If a local library assigns the classification number, it appears in a 090 field. In either scenario, the MARC record includes a classification number that represents a subject matter classification.

38. *OCLC Bibliographic Database*. The OCLC was created “to establish, maintain and operate a computerized library network and to promote the evolution of library use, of libraries themselves, and of librarianship, and to provide processes and products for the benefit of library users and libraries, including such

¹³ <http://www.loc.gov/marc/bibliographic/bd082.html>

objectives as increasing availability of library resources to individual library patrons and reducing the rate of rise of library per-unit costs, all for the fundamental public purpose of furthering ease of access to and use of the ever-expanding body of worldwide scientific, literary and educational knowledge and information.”¹⁴ Among other services, OCLC and its members are responsible for maintaining the WorldCat database (<http://www.worldcat.org/>), used by independent and institutional libraries throughout the world.

39. OCLC also provides its members online access to MARC records through its OCLC bibliographic database. When an OCLC member institution acquires a work, it creates a MARC record for this work in its computer catalog system in the ordinary course of its business. MARC records created at the Library of Congress are tape-loaded into the OCLC database through a subscription to MARC Distribution Services daily or weekly. Once the MARC record is created by a cataloger at an OCLC member institution or is tape-loaded from the Library of Congress, the MARC record is then made available to any other OCLC members online, and therefore made available to the public. Accordingly, once the MARC record is created by a cataloger at an OCLC member institution or is tape-loaded from the Library of Congress or another library anywhere in the world, any

¹⁴ Third Article, Amended Articles of Incorporation of OCLC Online Computer Library Center, Incorporated (available at <https://www.oclc.org/content/dam/oclc/membership/articles-of-incorporation.pdf>).

publication corresponding to the MARC record has been cataloged and indexed according to its subject matter such that a person interested in that subject matter could, with reasonable diligence, locate and access the publication through any library with access to the OCLC bibliographic database or through the Library of Congress.

40. When an OCLC member institution creates a new MARC record, OCLC automatically supplies the date of creation for that record. The date of creation for the MARC record appears in the fixed Field (008), characters 00 through 05. The MARC record creation date reflects the date on which, or shortly after which, the item was first acquired or cataloged. Initially, Field 005 of the MARC record is automatically populated with the date the MARC record was created in year, month, day format (YYYYMMDD) (some of the newer library catalog systems also include hour, minute, second (HHMMSS)). Thereafter, the library's computer system may automatically update the date in Field 005 every time the library updates the MARC record (*e.g.*, to reflect that an item has been moved to a different shelving location within the library). Field 005 is visible when viewing a MARC record via an appropriate computerized interface.

41. Once one library has cataloged and indexed a publication by creating a MARC record for that publication, other libraries that receive the publication do not create additional MARC records—the other libraries instead rely on the

original MARC record. They may update or revise the MARC record to ensure accuracy, but they do not replace or duplicate it. This practice does more than save libraries from duplicating labor. It also enhances the accuracy of MARC records. Further, it allows librarians around the world to know that a particular MARC record is authoritative (in contrast, a hypothetical system wherein duplicative records were created would result in confusion as to which record is authoritative).

42. Catalogers can create MARC records for all types of print, online, and digital resources. The date of creation of the MARC record by a cataloger at an OCLC member institution reflects when the underlying item is accessible to the public. Upwards of two-thirds to three-quarters of book sales to libraries come from a jobber or wholesaler for online and print resources. These resellers make it their business to provide books to their customers as fast as possible, often providing turnaround times of only a single day after publication. Libraries purchase a significant portion of the balance of their books directly from publishers themselves, which provide delivery on a similarly expedited schedule. In general, libraries make these purchases throughout the year as the books are published and shelve the books as soon thereafter as possible to make the books available to their patrons. Thus, books are generally available at libraries across the country within just a few days of publication.

43. *Journals*. Catalogers create MARC records for all types of print, online, and digital resources published in journals. For example, MARC records cover serial publications, including both serially-published monographs and journals. OCLC hosts MARC records representing more than 320 million serial publications. Serial publications are those publications that have the same collective title but are intended to be continued indefinitely with enumeration such as a volume or issue number (*e.g.*, magazines, journals, etc.). In the OCLC bibliographic database, the first issue of the serial publication is typically cataloged (*i.e.*, a corresponding MARC record is created), but the date is left open-ended with the use of a punctuation mark such as a dash. OCLC serial publication MARC records represent the entire run of the serial title. With knowledge of the first issue published, future issues can be predicted based on the information provided in the MARC record, for example in field 362. In my extensive professional experience, is it highly unusual for a library to stop collecting and shelving a serial publication prior to the end of its publication run. If a subscription to a serial publication ends its run or is cancelled before the end of its run, the library will denote that it has stopped receiving new volumes by filling in the end date in the MARC record.

44. The handling of printed journal subscriptions is shown on the cover or the first few pages of individual issues. As was the best practice among libraries,

issues arrived at a central facility and were immediately received, verified as part of a subscription, checked in, and stamped or labeled with the institution's name and date. Determining that the issue was part of the library subscription ensured that the entire set of publications for the year had been received so that they could be professionally bound and retained. This process also verified that all of the published issues arrived so that the library staff did not have to request or claim an issue that did not arrive as expected. In large public libraries with branches and multi-campus libraries within academic institutions, the journals were sorted and delivered to the subscribing unit. The new issue was placed in the public area; the older issue was stored so that it remained available.

45. The foregoing process has been standard library practice longer than I have been working in the profession. I first learned the steps in the process in the late 1970s and later supervised it. Although the checking in process has become automated and now links electronically to holdings records for the MARC record for each serial title, the manual placement of a stamp or label and placing the issue in a public area has not changed for 50 years. Unless I note otherwise below in reference to a specific serial publication, it is my expert opinion that this standard protocol was followed for all of the serial publications discussed below.

VI. PUBLICATIONS

A. “Mask R-CNN” by Kaiming He, Georgia Gkioxari, Piotr Dollár, and Ross Girshick (“He”) [Exhibit 1001]

46. Attached hereto as Exhibit 1001 is a copy of the journal article titled “Mask R-CNN” by Kaiming He, Georgia Gkioxari, Piotr Dollár, and Ross Girshick (hereafter “He”). The He article was published in Volume 42, Issue 2 of the journal *IEEE Transactions on Pattern Analysis and Machine Intelligence* and was found in the University of Wisconsin – Madison Libraries. The He article appears beginning on page 386 of this issue dated February 1, 2020. Exhibit 1001 is a true and correct copy of the He article (pages 386-397) that I understand is being submitted as an exhibit in these proceedings. Specifically, the text of the article is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. The He article is also available in the *IEEE Xplore* database published by the publisher, the Institute of Electrical and Electronics Engineers (IEEE)¹⁵ and the digital repository arXiv at Cornell University.¹⁶ Exhibit 1001 was found within the custody of a library – a place where an authentic copy of this journal would likely be. Exhibit 1001 is a true and correct copy in a condition that creates no suspicion about its authenticity.

¹⁵<https://ieeexplore.ieee.org/document/8372616>

¹⁶<https://arxiv.org/abs/1703.06870>

47. Attached hereto as Attachment 1A is a true and correct copy of the MARC record for the journal *IEEE Transactions on Pattern Analysis and Machine Intelligence* from the University of Wisconsin – Madison Libraries online catalog. The library ownership is indicated by the presence of the library’s code (“GZM”) in field 049. The library continues to update this MARC record and enhanced the MARC record to meet current cataloging rules. The most recent enhancement to Attachment 1A occurred on March 13, 2015, as shown in field 005 (“20150313”). I personally identified and retrieved the MARC record that is Attachment 1A.

48. Based on finding a copy of the He article in the University of Wisconsin – Madison Libraries and MARC record in its online library catalog attached as Attachment 1A, it is my opinion that the He article published in the journal *IEEE Transactions on Pattern Analysis and Machine Intelligence* was publicly available on June 5, 2018, as shown on the *IEEE Xplore* website.¹⁷ Attachment 1A also shows that the He article was catalogued with three descriptor terms reading “Pattern perception \$v Periodicals” (see Attachment 1B, Library of Congress subject heading sh85098789 and Attachment 1C, Library of Congress subject heading sh85099890), “Pattern recognition systems \$v Periodicals” (see Attachment 1D, Library of Congress subject heading sh85098791 and Attachment 1C, Library of Congress subject heading sh85099890), and “Artificial intelligence

¹⁷ <https://ieeexplore.ieee.org/document/8372616>

\$v Periodicals” (see Attachment 1E, Library of Congress subject heading sh2007101478) in the 650 fields.

49. As noted in the holdings information (362 field), the University of Wisconsin – Madison Libraries has received the journal *IEEE Transactions on Pattern Analysis and Machine Intelligence* since January 1979 and continues to receive the publication. In view of the MARC record for Exhibit 1001, the He article was publicly on June 5, 2018, because the serial title had been received, cataloged, and indexed at the University of Wisconsin – Madison Libraries and made part of its online catalog database.

50. Attached hereto as Attachment 1F is a true and correct copy of the MARC record for the journal *IEEE Transactions on Pattern Analysis and Machine Intelligence* obtained from the OCLC bibliographic database. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 1F, that library code is “NSD,” which means that the MARC record for this serial was cataloged as part of the National Serials Data Program at the Library of Congress. As can be seen in field 008 (“Date entered on file”) in the MARC record for the He article, a cataloger at the Library of Congress created OCLC record number 4253074 on September 26, 1978 (“780926”). The library continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to Attachment 1F occurred on October 8,

2025, as shown in field 005 (“20251008”). I personally identified and retrieved the MARC record that is Attachment 1F. The “BLvl” entry in Attachment 1F is “s,” which indicates that the journal *IEEE Transactions on Pattern Analysis and Machine Intelligence* is a serial publication. Field 310 of Attachment 1F reads “Monthly, \$b 1989-.” Accordingly, the MARC record for the He article corresponds to the journal *IEEE Transactions on Pattern Analysis and Machine Intelligence* from the time the serial title began publication and includes the date of the He article.

51. Attachment 1F includes an entry in field 050 (“Q327 \$b .I19”)—as described above, a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 082 (“001.53/4”), a subject matter consistent with the Dewey Decimal classification system. Attachment 1F further includes three descriptor terms reading “Pattern perception \$v Periodicals” (see Attachment 1B, Library of Congress subject heading sh85098789 and Attachment 1C, Library of Congress subject heading sh85099890), “Pattern recognition systems \$v Periodicals” (see Attachment 1D, Library of Congress subject heading sh85098791 and Attachment 1C, Library of Congress subject heading sh85099890), and “Artificial intelligence \$v Periodicals” (see Attachment 1E, Library of Congress subject heading sh2007101478) in the 650 fields. Thus, as of its cataloging, the

publication corresponding to the MARC record attached hereto as Attachment 1F was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entries. As of September 26, 1978, the MARC record attached hereto as Attachment 1F was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that subscribed to the serial, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

52. WorldCat indicates that the journal *IEEE Transactions on Pattern Analysis and Machine Intelligence* as cataloged at the Library of Congress is currently available from 790 libraries.¹⁸ In view of the above, this issue of the journal *IEEE Transactions on Pattern Analysis and Machine Intelligence* was publicly available on June 5, 2018, because by that date it had been cataloged and indexed at the Library of Congress, made part of the OCLC bibliographic database, and received at the University of Wisconsin – Madison Libraries. For these reasons, it is my opinion that the He article was published and accessible to the public on June 5, 1978.

¹⁸ <https://search.worldcat.org/title/4253074>

B. “NADS-Net: A Nimble Architecture for Driver and Seat Belt Detection via Convolutional Neural Networks” by Sehyun Chun, Nima Hamidi Ghalehjegh, Joseph B. Choi, Chris W. Schwarz, John G. Gaspar, Daniel V. McGehee, and Stephen S. Baek. (“Chun”) [Exhibit 1002]

53. Attached hereto as Exhibit 1002 is a copy of a conference paper published in the *Proceedings: 2019 International Conference on Computer Vision* found in the Paul and Rosemary Tribble Library at Christopher Newport University (Newport News, Virginia). The conference paper titled “NADS-Net: A Nimble Architecture for Driver and Seat Belt Detection via Convolutional Neural Networks” by Sehyun Chun, Nima Hamidi Ghalehjegh, Joseph B. Choi, Chris W. Schwarz, John G. Gaspar, Daniel V. McGehee, and Stephen S. Baek (hereafter “Chun”) appears beginning on page 2413. The proceedings were published online only by the Conference Publishing Services of the sponsoring organization, the Institute of Electrical and Electronics Engineers (IEEE). The IEEE/CVF International Conference on Computer Vision Workshops was held on October 27-November 2, 2019, in Seoul, Korea. Exhibit 1002 is a true and correct copy of the Chun conference paper (pages 2413-2421). I obtained this copy of the conference paper from the Paul and Rosemary Tribble Library at Christopher Newport University. Specifically, the text of the Chun conference paper is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit

1002 was found within the custody of a library – a place where, if authentic, a copy of this conference proceedings volume would likely be. Exhibit 1002 is a true and correct copy in a condition that creates no suspicion about authenticity.

54. The Chun conference paper is also available in the *IEEE Xplore* database,¹⁹ the arXiv digital repository at Cornell University,²⁰ and the digital repositories *ResearchGate*²¹ and *Semantic Scholar*.²²

55. Attached hereto as Attachment 2A is a true and correct copy of the MARC record for this digital conference proceedings volume from the Paul and Rosemary Tribble Library at Christopher Newport University online catalog.²³ The library continues to update and enhance this MARC record to meet current

¹⁹ <https://ieeexplore.ieee.org/document/9021959>

²⁰ <https://arxiv.org/abs/1910.03695>

²¹ https://www.researchgate.net/publication/336371993_NADS-Net_A_Nimble_Architecture_for_Driver_and_Seat_Belt_Detection_via_Convolutional_Neural_Networks

²² <https://www.semanticscholar.org/paper/NADS-Net%3A-A-Nimble-Architecture-for-Driver-and-Seat-Chun-Ghalehjogh/fa26d990c43c02fd9d8e91c44add2b7aa2fdd994>

²³ https://read.cnu.edu/discovery/fulldisplay?docid=alma991002596521008951&context=L&vid=01CNU_INST:Version2&lang=en&search_scope=MyInst_and_CI&adaptor=Local%20Search%20Engine&tab=Everything&query=any,contains,978-1-7281-5023-9&offset=0

cataloging rules. I personally identified and retrieved the library catalog record which is Attachment 2A.

56. Based on finding a digital copy of Exhibit 1002 in the Paul and Rosemary Tribble Library at Christopher Newport University and MARC record in its online library catalog attached as Attachment 2A, it is my opinion that the volume titled *Proceedings: 2019 International Conference on Computer Vision* was publicly available in the *IEEE Xplore* database on March 5, 2020, as shown on the website.²⁴

57. Attached hereto as Attachment 2B is a true and correct copy of the MARC record for the digital conference proceedings volume titled *Proceedings: 2019 International Conference on Computer Vision* obtained from the OCLC bibliographic database. I personally identified and retrieved the MARC record that is Attachment 2B. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 2B, that library code is “STF,” which means that the MARC record for this digital conference proceedings volume was cataloged at the Stanford University Libraries (Stanford, California). As can be seen in field 008 (“Date entered on file”) in the MARC record for this exhibit, a cataloger at the Stanford University Libraries created OCLC record number 1163929176 on February 2, 2020 (“200202”). The library

²⁴ <https://ieeexplore.ieee.org/document/9021959>

continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to the MARC record occurred on October 9, 2025, as shown in field 005 (“20251009”).

58. Attachment 2B further includes an entry in field 050 (“TA1634”)—as described above, a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system). Attachment 2B also shows that Exhibit 1002 was catalogued with a descriptor term reading “Computer vision \$v Congresses” (see Attachment 2C, Library of Congress subject heading sh2008101162) in the 650 field. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 2B was indexed according to its subject matter by virtue of at least two independently sufficient classifications: the field 050 entry and the field 650 entry. Further, as of February 2, 2020, the MARC record attached hereto as Attachment 2B was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that acquired the digital conference proceedings volume, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

59. WorldCat indicates that the digital volume titled *Proceedings: 2019 International Conference on Computer Vision* as cataloged at the Stanford

University Libraries is currently available from 278 libraries.²⁵ In view of the above, the volume titled *Proceedings: 2019 International Conference on Computer Vision* was publicly available on or shortly after February 2, 2020, because by that date it had been received, cataloged, and indexed at the Stanford University Libraries and made part of the OCLC bibliographic database. For these reasons, it is my opinion that Exhibit 1002 was published and publicly accessible on or shortly after February 2, 2020.

C. *Deep Learning* by Ian Goodfellow, Yoshua Bengio, and Aaron Courville (“Goodfellow”) [Exhibit 1003]

60. Attached hereto as Exhibit 1003 is a copy of two chapters from a book titled *Deep Learning* by Ian Goodfellow, Yoshua Bengio, and Aaron Courville (hereafter “Goodfellow”) and issued by MIT Press in 2016. Exhibit 1003 is a true and correct copy of the title page, table of contents, acknowledgements, notations, Chapter 6, “Deep Feedforward Networks” (pp. 164-223), and Chapter 9, “Convolutional Networks” (pp. 326-366) as held by the King Library at San José State University (San José, California). I obtained Exhibit 1003 from the digital copy of the Goodfellow book in the King Library at San José State University. The text in Exhibit 1003 is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible

²⁵ <https://search.worldcat.org/title/1163929176>

alterations to the document. Exhibit 1003 is a true and correct copy in a condition that creates no suspicion about its authenticity.

61. Attached hereto as Attachment 3A is a true and correct copy of the MARC record for this monograph from the King Library at San José State University online catalog. The library ownership is indicated by the presence of the library's code ("CSU") in the 995 field. The library continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to the MARC record occurred on November 7, 2024, as shown in field 005 ("20241107"). I personally identified and retrieved the library catalog record which is Attachment 3A.

62. The International Standard Book Number (ISBN) on Exhibit 1003 (0-2620-3561-8) matches the ISBN in the first field 020 of Attachment 3A. Therefore, Exhibit 1003 is the same book as the one that the cataloger in the King Library at San José State University used to create the MARC record that is Attachment 3A.

63. Attached hereto as Attachment 3B is a true and correct copy of the MARC record for the Goodfellow book titled *Deep Learning* obtained from the OCLC bibliographic database. I personally identified and retrieved the MARC record that is Attachment 3B. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 3B, that library code is "DLC," which means that the MARC record for this book was

created at the Library of Congress as part of the Cataloging in Publication (CIP) Program.²⁶ A cataloger prepares basic information about the forthcoming book which is included on the verso of the title page (also called the copyright page). The information is provided to save time needed for the cataloging process at the library after the book is purchased. The CIP data includes the author (field 100), title and subtitle (field 245), ISBN (field 022), suggested subject headings (field 650), classification numbers for the Library of Congress classification number (field 050), and the Dewey Decimal classification number (field 082). These data elements are included in the MARC record that the Library of Congress contributes to the OCLC bibliographic database. As can be seen in field 008 (“Date entered on file”) of the MARC record for this exhibit, a cataloger at the Library of Congress created OCLC record number 955778308 on June 13, 2016 (“160613”). The library continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to Attachment 3B occurred on September 2, 2025, as shown in field 005 (“20250902”). I personally identified and retrieved the MARC record that is Attachment 3B.

64. Attachment 3B further includes an entry in field 050 (“Q325.5 \$b .G66 2016”)—as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to

²⁶ <https://www.loc.gov/publish/cip/>.

the Dewey Decimal classification system) and an entry in field 082 (“006.3/1”), a subject matter consistent with the Dewey Decimal classification system.

Attachment 3B further includes a descriptor term reading “Machine learning” (see Attachment 3C, Library of Congress subject heading sh85079324) in the 650 field.

Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 3B was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entry. Further, as of June 13, 2016, the MARC record attached hereto as Attachment 3B was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that added this book to its collection, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

65. Further supporting my opinion that Exhibit 1003 was publicly accessible to ordinarily skilled and interested researchers in the field is the fact that the book titled *Deep Learning* was registered with the U. S. Copyright Office as item TX0008357894 on November 25, 2016, and indicated a publication date of November 14, 2016 (see Attachment 3D, U. S. Copyright Office Public Catalog). As noted above, this would have provided a POSITA with keyword searching capabilities and other tools to locate this book.

66. WorldCat indicates that the Goodfellow book titled *Deep Learning* as cataloged at the Library of Congress is currently available from 1,005 libraries.²⁷ In view of above, the Goodfellow monograph was publicly available on or shortly after November 14, 2016, because by that date it had been received, cataloged, and indexed at the Library of Congress and made part of the OCLC bibliographic database. For these reasons, it is my opinion that Exhibit 1003 was published and accessible to the public on or shortly after November 14, 2016.

D. *Deep Learning for Computer Visions* by Rajalingappaan Shanmugamani (“Shanmugamani”) [Exhibit 1004]

67. Attached hereto as Exhibit 1003 is a copy of two chapters from a book titled *Deep Learning for Computer Visions* by Rajalingappaan Shanmugamani (hereafter “Shanmugamani”) and issued by Packt in 2018. Exhibit 1004 is a true and correct copy of the cover, title page, copyright page, table of contents, Chapter 1, “Getting Started” (pp. 7-37); Chapter 2, “Image Classification” (pp. 39-78); Chapter 4, “Object Detection” (pp. 109-130); Chapter 5, “Semantic Segmentation” (p. 131); and, Chapter 9, “Video Classification” (pp. 239-264) as held by the King Library at San José State University (San José, California). I obtained Exhibit 1004 from the digital copy of the Shanmugamani book in the King Library at San José State University. The text in Exhibit 1004 is complete; no pages are missing,

²⁷ <https://search.worldcat.org/title/955778308>

and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1004 is a true and correct copy in a condition that creates no suspicion about its authenticity.

68. Attached hereto as Attachment 4A is a true and correct copy of the MARC record for this monograph from the King Library at San José State University online catalog.²⁸ The library continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to the MARC record occurred on May 6, 2024, as shown in field 005 (“20240506”). I personally identified and retrieved the library catalog record which is Attachment 4A.

69. The International Standard Book Number (ISBN) on Exhibit 1004 (978-1-78829-562-8) matches the ISBN in the tenth field 035 of Attachment 4A. Therefore, Exhibit 1004 is the same book as the one that the cataloger in the King Library at San José State University used to create the MARC record that is Attachment 4A.

²⁸ https://csu-sjsu.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma991071822128802901&context=L&vid=01CALS_SJO:01CALS_SJO&lang=en&search_scope=MyInst_and_CI&adaptor=Local%20Search%20Engine&tab=Everything&query=any,contains,Shanmugamani,%20Rajalingappaa&offset=0

70. Attached hereto as Attachment 4B is a true and correct copy of the MARC record for the Shanmugamani book titled *Deep Learning for Computer Visions* obtained from the OCLC bibliographic database. I personally identified and retrieved the MARC record that is Attachment 4B. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 4B, that library code is “EBLCP,” which means that the MARC record for this book was created at the EBook Library, a commercial vendor (Claremont, Western Australia, Australia). As can be seen in field 008 (“Date entered on file”) of the MARC record for this exhibit, a cataloger at the EBook Library created OCLC record number 1022793819 on February 23, 2018 (“180223”). The library continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to Attachment 4B occurred on July 18, 2025, as shown in field 005 (“20250718”). I personally identified and retrieved the MARC record that is Attachment 4B.

71. Attachment 4B further includes an entry in field 050 (“TA347.A78 \$b S43 2018”)—as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 082 (“006.3”), a subject matter consistent with the Dewey Decimal classification system. Attachment 4B further includes two descriptor terms reading “Artificial

intelligence” (see Attachment 4C, Library of Congress subject heading sh85008180) and “Neural networks (Computer science)” (see Attachment 4D, Library of Congress subject heading sh90001937) in the 650 fields. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 4B was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entries. Further, as of February 23, 2018, the MARC record attached hereto as Attachment 4B was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that added this book to its collection, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

72. WorldCat indicates that the Shanmugamani book titled *Deep Learning for Computer Visions* as cataloged at the EBook Library is currently available from 1,191 libraries.²⁹ In view of above, the Shanmugamani monograph was publicly available on or shortly after February 23, 2018, because by that date it had been cataloged and indexed at the EBook Library, made part of the OCLC bibliographic database, and received in the King Library at San José State University. For these

²⁹ <https://search.worldcat.org/title/1022793819>

reasons, it is my opinion that Exhibit 1004 was published and accessible to the public on or shortly after February 23, 2018.

VII. SUMMARY OF OPINIONS

73. In view of the foregoing, it is my opinion that the publications described above were publicly available no later than the corresponding date listed in the table below:

Exhibit	Publication	Publicly Available
1001	He, Kaiming, Georgia Gkioxari, Piotr Dollár, and Ross Girshick. “Mask R-CNN.” <i>IEEE Transactions on Pattern Analysis and Machine Intelligence</i> , vol. 42, issue 2 (1 February 2020): 386-397.	June 5, 2018
1002	Chun, Sehyun, Nima Hamidi Ghalehjeh, Joseph B. Choi, Chris W. Schwarz, John G. Gaspar, Daniel V. McGehee, and Stephen S. Baek. “NADS-Net: A Nimble Architecture for Driver and Seat Belt Detection via Convolutional Neural Networks.” <i>Proceedings: 2019 International Conference on Computer Vision</i> (pp. 2413-2421). Los Alamitos, CA: IEEE Computer Society, 2019.	February 2, 2020
1003	Goodfellow, Ian, Yoshua Bengio, and Aaron Courville. <i>Deep Learning</i> . Cambridge, MA: MIT Press, 2016.	November 14, 2016
1004	Shanmugamani, Rajalingappaa. <i>Deep Learning for Computer Visions</i> . Birmingham, United Kingdom: Packt, 2018.	February 23, 2018

74. In signing this Declaration, I recognize that the Declaration will be filed as evidence in a case before the U.S. District Court for the District of Delaware. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

75. I reserve the right to supplement my opinion in the future to consider any new information that becomes available to me, and to respond to any arguments raised by Plaintiffs. I also reserve the right to create and rely on additional summaries, figures, or other demonstratives to support my opinions at a hearing or trial.

76. I declare under penalty of perjury that the foregoing is true and correct.

Date: November 6, 2025


Sylvia D. Hall-Ellis, Ph.D.