

CURRICULUM VITAE

University of Idaho

NAME: Xiaogang Ma

DATE: July 29, 2020

RANK OR TITLE: Assistant Professor

DEPARTMENT: Computer Science

OFFICE LOCATION AND CAMPUS ZIP:

University of Idaho, Department of Computer Science
875 Perimeter Drive MS 1010 (Janssen Engineering Building 230)
Moscow, ID 83844-1010, USA

OFFICE PHONE: 208-885-1547

FAX: 208-885-9052

EMAIL: max@uidaho.edu

WEB: <https://webpages.uidaho.edu/max/>

DATE OF FIRST EMPLOYMENT AT UI: August 14, 2016

DATE OF TENURE: Untenured

DATE OF PRESENT RANK OR TITLE: August 14, 2016

EDUCATION BEYOND HIGH SCHOOL:

Degrees:

11/2011	Ph.D., Earth Systems Science & GIScience, ITC, University of Twente, Enschede, Netherlands
12/2009	Dr.Eng. (with distinction), Geoinformatics Engineering, China University of Geosciences, Wuhan, China
06/2002	B.Eng. (with distinction), Land Resources Management, China University of Geosciences, Wuhan, China

EXPERIENCE:

Teaching, Extension and Research Appointments:

2016–present	Assistant Professor, Department of Computer Science, University of Idaho
2018–present	Affiliate Faculty, Department of Geological Sciences, University of Idaho
2016–present	Visiting Scientist, Tetherless World Constellation, Rensselaer Polytechnic Institute
2014–2016	Associate Research Scientist, Tetherless World Constellation, Rensselaer Polytechnic Institute
2012–2014	Sloan DCO Data Science Postdoctoral Fellow, Tetherless World Constellation, Rensselaer Polytechnic Institute
2013	Adjunct Faculty, Dept. of Earth & Environmental Sciences, Rensselaer Polytechnic Institute
2011–2012	Researcher, Earth Systems Science, ITC, University of Twente, the Netherlands
2008	Visiting Scientist, Geodata Interoperability, Geological Survey of Canada and York University

TEACHING ACCOMPLISHMENTS:

Areas of Specialization:

- Data science
- Semantics, knowledge graph and data interoperability
- Exploratory data analytics and visualization
- Programming language
- Geoinformatics

Courses Taught: (number of enrollments is shown with each semester)

Full Semester Courses

- CS 120: Computer Science I F18 (30)
- CS 479/579: Data Science S17 (5); S18 (37); S19 (45); S20 (24)
- CS 489/589: Semantic Web and Open Data F17 (16); F19 (17)
- ISEM 301: The Beauty of Data Science S17 (20); S18 (22)
- EARTH 4750: GIS in the Sciences (at Rensselaer Polytechnic Institute): S13 (15)

Directed Studies

- CS 502: DS Semantic eScience S17 (1); S18 (6); F18 (4); F19 (1)
- CS 502: DS Data Analytics in R S20 (3)

Student Research and Projects

- CS 600: Doctoral Research and Dissertation F16 (1); S17 (1); F17 (1); S18 (4); F18 (9); S19 (7); F19 (6); S20 (6)
- CS 500: Master's Research and Dissertation S17 (1); F17 (1); S18 (1)
- CS 580: Graduate Project SU18 (1); F18 (5); S19 (3); F19 (4); S20(6)
- CS 598: Industrial Internship SU18 (1)

Students / Scholars Advised: (UI-University of Idaho; RPI-Rensselaer Polytechnic Institute; CS-Computer Science)

Undergraduate Students

- About 6 undergraduate students per semester at UI

Graduate Students (denotes non-thesis master)*

Advised to completion of degree - major professor

1. Manjunath Mulinti*, M.Sc., CS, UI, 08/2020
2. Lamyaa Alharbi*, M.Sc., CS, UI, 05/2020
3. Samarth Subramanya*, M.Sc., CS, UI, 05/2020
4. Bhargav Rao*, M.Sc., CS, UI, 05/2020
5. Abhinav Prabhu Adarapuram*, M.Sc., CS, UI, 05/2020
6. Adhar Singh*, M.Sc., CS, UI, 05/2019
7. Rohit Yadav*, M.Sc., CS, UI, 05/2019
8. Fatemh Almeman*, M.Sc., CS, UI, 12/2018
9. Chama Salil Reddy*, M.Sc., CS, UI, 12/2018, now software engineer at Quadgen Wireless Solutions Inc.
10. Bhuwan Madhikarmi, M.Sc., CS, UI, 05/2018, now senior data scientist at Washington State University

Advised to completion of degree - co-major professor

1. Chengbin Wang, Ph.D., Geoinformatics, China University of Geosciences, 06/2018, now associate professor at China University of Geosciences

Served on graduate committee

1. Hamad Al Salem, Ph.D., CS, expected 12/2021
2. Edward Flathers, Ph.D., Natural Resources and Geoinformatics, UI, expected 05/2020
3. Longze Li, M.Sc., CS, UI, 05/2020
4. Xin Mou, Ph.D., CS, UI, 12/2018, now senior software engineer at Lucid
5. Afnan Alsharif, M.Sc., CS, UI, 12/2017

Currently advising as major professor

1. Abdullah Alowairdhi, Ph.D., CS, UI, expected 12/2020
2. Ashrf Althbiti, Ph.D., CS, UI, expected 05/2021
3. Raed Alsini, Ph.D., CS, UI, expected 12/2021
4. Omar Alghushairy, Ph.D., CS, UI, expected 12/2021
5. Rayan Alshamrani, Ph.D., CS, UI, expected 05/2022
6. Jiyin Zhang, Ph.D., CS, UI, expected 05/2023
7. Fatimah Alkomah, Ph.D., CS, UI, expected 05/2023
8. Amruta Kale*, M.Sc., CS, UI, expected 12/2020
9. Chunnan Zhang*, M.Sc., CS, UI, expected 12/2020
10. Ashwag Sharea*, M.Sc., CS, UI, expected 05/2021
11. Shrooq Algarni*, M.Sc., CS, UI, expected 05/2021

Other graduate students who conducted part of their work under my supervision

1. Tzu-Hua (Matt) Yang, M.Sc., CS, UI (2019-2020)
2. Travis DeVault, Ph.D., CS, UI (TA for Spring 2019)
3. Seema Kamod, M.Sc., CS, UI (TA for Fall 2018)

4. Homaja Marisetty, M.Sc., CS, UI (TA for Spring 2018, RA for Summer 2018)
5. Olivier Bizimana, M.Sc., CS, UI (RA for Spring 2017), now at Intel
6. Apurva Sinha, M.Sc., CS, RPI (2015), now at Charles River Development
7. Congrui Li, Ph.D., CS, RPI (2015-2016)
8. Sophie Kolankowski, M.Sc., Geoinformatics, RPI (2015-2016), now at Tyler Technologies
9. Sumithra Gnanasekar, M.Sc., CS, RPI (2014), now at Oracle
10. Lakshmi Chenicheri, M.Sc., CS, RPI (2014), now at Deloitte
11. Ahmed Eleish, M.Sc. and Ph.D., CS, RPI (2014-2016)
12. Hao Zhong, Ph.D., CS, RPI (2014-2016)
13. Anirudh Prabhu, Ph.D., CS, RPI (2013-2016)
14. Chengcong Du, M.Sc., CS, RPI (2013), now at Expedia
15. Anusha Akkiraju, M.Sc., CS, RPI (2013), now at Oracle
16. Jun Xu, M.Sc., CS, RPI (2013), now at Snap
17. Boliang Zhang, M.Sc., CS, RPI (2013), now PhD student at RPI
18. Harsha Venkata, M.Sc., CS, RPI (2013), now at Facebook
19. Mengyu Yin, M.Sc., CS, RPI (2013), now at CMU
20. Krishna Aradhi, M.Sc., CS, RPI (2013), now at Percolate
21. Han Wang, Ph.D., CS, RPI (2012-2016), now at Amazon
22. Benno Lee, Ph.D., CS, RPI (2012-2016)
23. Linyun Fu, Ph.D., CS, RPI (2012-2015), now at Twitter
24. Yu Chen, Ph.D., CS, RPI (2012-2015), now at Twitter
25. Jin Guang Zheng, Ph.D., CS, RPI (2012-2015), now at Memect
26. Eric Rozell, M.Sc., CS, RPI (2012-2014), now at Microsoft

Undergraduate Research Students

1. Can Cai, CS, UI (2019-2020)
2. Tim Sonnen, CS, UI (MURI intern, Summer and Fall 2017), now at Chief Architect
3. Ali Nendick, CS, RPI (2012-2014)

Highschool Student Researches

1. Kaleo Sato, CS Summer Camp, RPI (Summer 2015), enrolled by UC Irvine
2. Stephen Moon, CS Summer Camp, RPI (Summer 2015), enrolled by Harvard University

Visiting Scholars at UI

1. Haifeng Lian, Professor, Fujian Agriculture and Forestry University, China, 08/2019-08/2020
2. Rongbin Tang, PhD student, China University of Geosciences, Beijing, 08/2019-08/2020
3. Xiang Que, Lecturer, Fujian Agriculture and Forestry University, China, 12/2018-12/2019
4. Li Sun, Associate Professor, Chinese Academy of Geological Sciences, 09/2017-12/2017
5. Chengbin Wang, PhD student, China University of Geosciences, Wuhan, 09/2016-09/2017

Student and Advisee Awards and Honors:

- 2020 PhD student Omar Alghushairy received Travel Award from the University of Idaho Graduate and Professional Student Association (GPSA)
- 2019 Postdoctoral researcher Dr. Chao Ma received the ESIP 2019 Funding Friday Award (\$5,000)
Collaborating MSc Student Matt Yang received the International Tuition Scholarship at University of Idaho
PhD student Rayan Alshamrani awarded Best Poster at the 2019 University of Idaho Computer Science Industrial Advisory Board Meeting
PhD student Abdullah Alowairdhi awarded the ESIP Lab Research Grant (\$7,000)
PhD students Rayan Alshamrani, Ashrf Althbiti and Abdullah Alowairdhi awarded US2TS2019 travel grant from Sloan
- 2018 PhD student Ashrf Althbiti awarded US2TS2018 travel grant from NSF
PhD student Abdullah Alowairdhi, MSc students Chama Salil Reddy and Homaja Marisetty received scholarship from Idaho EPSCoR program
- 2017 Visiting PhD student Chengbin Wang awarded Elsevier and IAMG Research Grant
Visiting PhD student Chengbin Wang awarded USGS travel grant for USGS-DTDI workshop
Collaborating PhD student Xin Mou awarded USGS travel grant for USGS-DTDI workshop
Collaborating PhD student Xin Mou's paper was selected as Finalist of Demo Paper Track at 2017 IEEE

International Conference on Data Engineering (ICDE)
 MSc students Bhuwan Madhikarmi and Olivier Bizimana received scholarship from Idaho EPSCoR program
 Undergraduate student Tim Sonnen awarded MURI undergraduate research internship twice from from Idaho EPSCoR program

Courses Developed:

- Data Science (CS 479/579)
 A 3-credit course that combines a skill-set of data collection, data management, data analytics, data visualization and result communication using supporting cyberinfrastructure and information technology. It is selected as a core course for the Data Analytics certificate program at the University of Idaho.
- Semantic Web and Open Data (CS 489/589)
 A 3-credit course that introduces the technological framework of the Semantic Web and Linked Open Data, as well as associated research topics and opportunities for large scale data integration, reasoning and analysis.
- The Beauty of Data Science (ISEM 301)
 A 1-credit general education course for junior and sophomore. The course offers an overview of key topics in a data life cycle, and demonstrates how data science facilitates interdisciplinary collaboration.
- Computer Science I (CS 120)
 A four-credit course including topics of fundamental programming constructs, algorithms, and problem solving, fundamental data structures, overview of programming languages, virtual machines, introduction to language translation, declarations and types, abstraction mechanisms, object-oriented programming.
- Spatial Data Analysis (developed at CS 400/500 level, not taught yet)
 A 4-credit course. Key topics include: map projections, reference frames, multivariate analysis, correlation analysis, regression, interpolation, extrapolation, and kriging. Database concepts of building a spatial database, SQL, spatial query, and integration of graphic and tabular data are also covered.

Non-credit Classes, Workshops, Seminars, Invited Lectures, etc.:

- 2020, A new structure for version control in a deep time knowledge graph. 2020 Deep-time Digital Earth Knowledge System Workshop. [30 minutes]
- 2020, A new structure for representing and tracking version information in a deep time knowledge graph. ESIP Semantic Technology Committee Telecon. [30 minutes]
- 2019, Ideas about a Geochemical Data Repository from the Perspective of Semantic Web. Webinar for the NSF Geobiology and Low-Temperature Geochemistry Program. [One hour]
- 2019, Towards a machine-readable knowledge base of deep time. The Fifth Deep-time Digital Earth (DDE) Working Group Seminar, Kunshan, China [Plenary Keynote Talk – 45 minutes]
- 2019, Why we need a machine-readable knowledge base of deep time and our approach to build it. Carnegie Institution for Science – Geophysical Laboratory, Washington, DC. [Invited Seminar – One hour]
- 2019, Geoinformatics and Geo-Data Science in Practice. The 644th Session of the Xiangshan Science Conference, Deep-time Digital Earth: International Workshop on Paleogeography Reconstruction and Deep-time Big Data, Beijing, China. [Invited Plenary Seminar – 45 minutes]
- 2018, Data Science for Complex Systems: Cross-Disciplinary Collaborations from Elements to Ecosystems, Biology of Vector-borne Diseases (BVBD) Summer Course, Moscow, ID.
- 2018, Geo-Data Science: Leveraging Geoscience Research with Geoinformatics, Semantics and Open Data, UI-WSU Geology Seminar, Moscow, ID. [45 minutes]
- 2017, Weaving a Knowledge Network for a Research Program using Semantic Web Technologies. University of Idaho Library Workshop, Moscow, ID. [45 minutes]
- 2017, Open Science, FAIR Data and Data Standards. Workshop for Research Data Management at the 67th Annual Meeting of the American Crystallographic Association, New Orleans, LA.
- 2017, Guest lecture, CS 400/501 SEM: Contemporary Issues in CS, Moscow, ID.
- 2016, Guest lecture, CS 400/501 SEM: Contemporary Issues in CS, Moscow, ID.
- 2016, Expressivity and Reasoning: Examples in Geologic Time and Mineral Observations. 2016 ESIP Summer Meeting, Durham, NC.

- 2016, Recent examples of data science for geosciences. China University of Geosciences, Wuhan, China.
- 2016, SEM+: a tool for concept mapping in geoscience. Ontology Summit: GeoScience and Semantic Interoperability Session, 2016-03-31.
- 2015, Geoinformatics in the Semantic Web. IAMG'15 Conference, Freiberg, Germany. [Andrei B. Vistelius Research Award Lecture]
- 2015, Science 3.0: Open Science in an Open World. Global Young Academy Annual Meeting, Montebello, QC, Canada.
- 2015, An entity linking service for documents and datasets in Earth and environmental sciences, ESIP Testbed Showcase Webcast.
- 2015, Exploring the Web of Data for Earth and Environmental Sciences, McGill University, Montreal, Canada.
- 2015, Geodata sharing and application in the Semantic Web. China University of Geosciences, Wuhan, China.
- 2014, Why Data Science Matters. SciDataCon2014, New Delhi, India. [ICSU-WDS Data Stewardship Award Lecture]
- 2014, A formal geologic time model and its application for harmonizing heterogeneous geoscience information. The Deep-Time Data Workshop, San Francisco, CA.
- 2014, Deep-Time Data Infrastructure. The Deep-Time Data Workshop, San Francisco, CA.
- 2014, Deep-Time Data Infrastructure: A Socio-technical System. The Deep-Time Data Workshop, San Francisco, CA.
- 2014, Capturing and Presenting Provenance of Global Change Research. Tetherless World Constellation TWed Talk Series 2014 Fall, Troy, NY.
- 2014, Deep Carbon Virtual Observatory: Leveraging data science to facilitate earth science research. DCO EPC Workshop. Los Angeles, CA.
- 2014, A Golden Spike Information Portal Enabled by Semantic Technologies and Data Visualization. Webinar - NSF EarthCube Collaboration and Cyberinfrastructure for Paleogeosciences.
- 2014, Why Data Science Matters and What We Can Do With It. DCO Summer School 2014. Big Sky, MT.
- 2014, Experience in Ontology Engineering with the Global Change Information System. April 2014 Webinar of ESIP Semantic Web Cluster.
- 2014, Deep Earth Computer: A Platform for Linked Science of the Deep Carbon Observatory Community. 2014 Deep Carbon Observatory Early Career Scientist Workshop, San José, Costa Rica.
- 2014, Technologies and Functionalities of the Platform for Linked Science of the Deep Carbon Observatory Community. 2014 Deep Carbon Observatory Early Career Scientist Workshop, San José, Costa Rica.
- 2014, Data Sharing and Interoperability in the Deep Carbon Observatory. EarthCube Data Facilities Workshop, Arlington, VA.
- 2013, A Use Case-Driven Iterative Method for Building a Provenance-Aware GCIS Ontology. ESIP 2013 Summer Meeting, Chapel Hill, NC.
- 2013, Data Management Plans for the Deep Carbon Observatory: What, Why and How? Deep Carbon Observatory International Science Meeting, Washington, DC.
- 2013, Deep Energy Science Discovery using DCO's Data Infrastructure, Management, and Science Network. DCO – Deep Energy Workshop, Manchester, UK.
- 2012, Geo-Informatics and the Semantic Web. Webinar for Purdue University.
- 2011, Ontology Spectrum for Geological Data Interoperability. China University of Geosciences, Wuhan, China.
- 2010, Development of a SKOS-based Multilingual Thesaurus for Automatic Translation of Geological Time Scale Terms in Online Geological Maps. In: IUGS-CGI and OneGeology-Europe International Geoscience Language Workshop, Berlin, Germany.
- 2010, Building and Using Geoscience Thesauri. Geological Survey of the Netherlands, TNO, Utrecht, Netherlands.

Honors and Awards in Educational and Outreach Activities:

- | | |
|------|---|
| 2019 | Invited Seminar at The 644th Session of the Xiangshan Science Conference, Beijing |
| 2017 | Guest Professor at China University of Geosciences, Wuhan |
| 2016 | Invited Panelist, International Data Week, Denver, CO |
| 2015 | NSF-EarthCube Distinguished Lecturer |

SCHOLARSHIP ACCOMPLISHMENTS:**Publications, Exhibitions, Performances, Recitals:** (* denotes student or postdoc advisees)**Refereed/Adjudicated:** (sub-total: 19 as first author; 21 as corresponding author)*Refereed Journal Papers*

1. *Chen, Q., Liu, G., **Ma, X.**, Li, X., He Z., 2020. 3D stochastic modeling framework for Quaternary sediments using multiple-point statistics: a case study in Minjiang Estuary area, Southeast China. *Computers & Geosciences*. 136, 104404.
2. He, Z., Liu, G., **Ma, X.**, *Chen, Q., 2019. GeoBeam: A Distributed Computing Framework for Spatial Data. *Computers & Geosciences*. 131, 15-22.
3. Zeng, Y., Su, Z., Barmpadimos, I., Perrels, A., Poli, P., Boersma, K.f., Frey, A., **Ma, X.**, de Bruin, K., Gossen, H., Timmermans, W., 2019. Towards a Traceable Climate Service: Assessment of Quality and Usability of Essential Climate Variables. *Remote Sensing*, 11(10), 1186. [open access]
4. *Chen, Q., Liu, G., **Ma, X.**, Zhang, J., Zhang, X., 2019. Conditional multiple-point geostatistical simulation for unevenly distributed sample data. *Stochastic Environmental Research and Risk Assessment*. 33, 973-987.
5. Hazen, R.M., Downs, R.T., *Eleish, A., Fox, P., Gagne, O., Golden, J.J., Grew, E.S., Hummer, D.R., Hystad, G., Krivovichev, S.V., Li, C., Liu, C., **Ma, X.**, Morrison, S.M., *Pan, F., Pires, A.J., *Prabhu, A., Ralph, J., Rumyon, S.E., *Zhong, H., 2019. Data-driven discovery in mineralogy: Recent advances in data resources, analysis, and visualization. *Engineering*, 5 (3), 397-405. [invited review article]
6. **Ma, X.**, 2019. Geo-Data Science: Leveraging Geoscience Research with Geoinformatics, Semantics and Open Data. *Acta Geologica Sinica (English Edition)*, 93(s1), 44-47. [article for invited keynote talk | open access]
7. Morrison, S.M., Prabhu, A., *Eleish, A., *Pan, F., *Zhong, H., Huang, F., Fox, P., **Ma, X.**, Ralph, J., Golden, J.J., Downs, R., Liu, C., Runyon, S.E., Hazen, R.M., 2019. Application of Advanced Analytics and Visualization in Mineral Systems. *Acta Geologica Sinica (English Edition)*, 93(s1), 55-55. [short article for invited keynote talk | open access]
8. *Chen, Q., Mariethoz, G., Liu, G., Comunian, A., **Ma, X.**, 2018. Locality-based 3-D multiple-point statistics reconstruction using 2-D geological cross-sections. *Hydrology and Earth System Sciences*, 22, 6547-6566.
9. *Chen, Q., Liu, G., **Ma, X.**, Yao, Z., Tian, Y., 2018. A virtual globe-based integration and visualization framework for aboveground and underground 3D spatial objects. *Earth Science Informatics*, 11 (4), 591-603.
10. **Ma, X.**, *Fu, L., West, P., Fox, P., 2018. Ontology Usability Scale: Context-aware metrics for the effectiveness, efficiency and satisfaction of ontology uses. *Data Science Journal*, 17, 10. [open access]
11. He, Z., **Ma, X.**, 2018. A distributed indexing method for timeline similarity query, *Algorithms*, 11 (4), 41. [open access]
12. *Wang, C., **Ma, X.**, Chen, J., 2018. The application of data pre-processing technology in the geoscience big data. *Acta Petrologica Sinica*, 34 (2), 303-313. [open access | in Chinese with English abstract].
13. *Chen, Q., Liu, G., **Ma, X.**, Mariethoz, G., He, Z., Tian, Y., Weng, Z., 2018. Local curvature entropy-based 3D terrain representation using a comprehensive Quadtree. *ISPRS Journal of Photogrammetry and Remote Sensing*, 139, 30-45.
14. *Wang, C., **Ma, X.**, Chen, J., 2018. Ontology-driven data integration and visualization for exploring regional geologic time and paleontological information, *Computers & Geosciences*, 115, 12-19.
15. *Wang, C., **Ma, X.**, Chen, J., Chen, J., 2018. Information extraction and knowledge graph construction from geoscience literature. *Computers & Geosciences*, 112, 112-120.
16. **Ma, X.**, Hummer, D., Golden, J.J., Fox, P.A., Hazen, R.M., Morrison, S.M., Downs, R.T., *Madhikarmi, B.L., Wang, C., Meyer, M.B., 2017. Using Visual Exploratory Data Analysis to Facilitate Collaboration and Hypothesis Generation in Cross-Disciplinary Research. *International Journal of Geo-Information* 6 (11), 368. [open access | feature paper]
17. **Ma, X.**, 2017. Linked Geoscience Data in practice: where W3C standards meet domain knowledge, data visualization and OGC standards. *Earth Science Informatics*, 10(4), 429-441.
18. *Chen, Q., Liu, G., **Ma, X.**, Li, X., He, Z., 2017. Fractal generator for efficient production of random planar patterns and symbols in digital mapping. *Computers & Geosciences*, 105, 91-102.
19. **Ma, X.**, West, P., Zednik, S., Erickson, J., *Eleish, A., *Chen, Y., *Wang, H., *Zhong, H., Fox, P., 2017. Weaving a knowledge network for Deep Carbon Science. *Frontiers in Earth Science*, 5, 36. [open access | special issue of early career scientist contributions to the Deep Carbon Observatory]
20. **Ma, X.**, Erickson, J., Zednik, S., West, P., Fox, P., 2016. Semantic specification of data types for a world of Open Data. *ISPRS International Journal of Geo-Information*, 5(3), 38. [open access]
21. *Zheng, J.G., *Fu, L.Y., **Ma, X.**, Fox, P., 2015. SEM+: Tool for discovering concept mapping in Earth science related domain. *Earth Science Informatics* 8 (1), 95-102.
22. **Ma, X.**, Fox, P., Narock, T., Wilson, B., 2015. Editorial: Semantic eScience. *Earth Science Informatics* 8 (1), 1-3.

23. **Ma, X.**, Fox, P., Tilmes, C., Jacobs, K., Waple, A., 2014. Capturing provenance of global change information. *Nature Climate Change* 4 (6), 409–413.
24. **Ma, X.**, *Zheng, J.G., Goldstein, J., Zednik, S., *Fu, L., Duggan, B., Aulenbach, S., West, P., Tilmes, C., Fox, P., 2014. Ontology engineering in provenance enablement for the National Climate Assessment. *Environmental Modelling & Software* 61, 191-205.
25. **Ma, X.**, Fox, P., *Rozell, E., West, P., Zednik, S., 2014. Ontology dynamics in a data life cycle: challenges and recommendations from a geoscience perspective. *Journal of Earth Science* 25 (2), 407–412.
26. **Ma, X.**, Fox, P., Mayernik, M.S., 2014. Strengthening an Interagency Network for Geoscience Data Sets: Report of Geodata 2014 Workshop. *Eos, Transactions American Geophysical Union* 95 (45), 411–411.
27. Tilmes, C., Fox, P., **Ma, X.**, McGuinness, D., Privette, A.P., Smith, A., Waple, A., Zednik, S., *Zheng, J., 2013. Provenance representation for the National Climate Assessment in the Global Change Information System. *IEEE Transactions on Geoscience and Remote Sensing* 51 (11), 5160–5168.
28. **Ma, X.**, Fox, P., 2014. A jigsaw puzzle layer cake of spatial data. *Eos, Transactions American Geophysical Union* 95 (19), 161–161.
29. **Ma, X.**, Fox, P., 2013. Recent progress on geologic time ontologies and considerations for future works. *Earth Science Informatics* 6 (1), 31–46.
30. He, Z., Kraak, M.-J., Huisman, O., **Ma, X.**, Xiao, J., 2013. Parallel indexing technique for spatio-temporal data. *ISPRS Journal of Photogrammetry and Remote Sensing* 78, 116–128.
31. **Ma, X.**, Carranza, E.J.M., Wu, C., van der Meer, F.D., 2012. Ontology-aided annotation, visualization and generalization of geological time scale information from online geological map services. *Computers & Geosciences* 40 (3), 107–119.
32. **Ma, X.**, Asch, K., Laxton, J.L., Richard, S.M., Asato, C.G., Carranza, E.J.M., van der Meer, F.D., Wu, C., Duclaux, G., Wakita, K., 2011. Data exchange facilitated. *Nature Geoscience* 4 (12), 814–814.
33. **Ma, X.**, Carranza, E.J.M., Wu, C., van der Meer, F.D., Liu, G., 2011. A SKOS-based multilingual thesaurus of geological time scale for interoperability of online geological maps. *Computers & Geosciences* 37 (10), 1602–1615.
34. **Ma, X.**, Wu, C., Carranza, E.J.M., Schetselaar, E.M., van der Meer, F.D., Liu, G., Wang, X., Zhang, X., 2010. Development of a controlled vocabulary for semantic interoperability of mineral exploration geodata for mining projects. *Computers & Geosciences* 36 (12), 1512–1522.
35. **Ma, X.**, Carranza, E.J.M., van der Meer, F.D., Wu, C., Zhang, X., 2010. Algorithms for multi-parameter constrained compositing of borehole assay intervals from economic aspects. *Computers & Geosciences* 36 (7), 945–952.
36. **Ma, X.**, Wang, X., Wu, C., Ju, F., 2007. Metadata hierarchy in integrated geoscientific database for regional mineral prospecting. *Geo-spatial Information Science* 10 (3), 223–227.

Refereed Conference Papers

1. *Alghushairy, O., *Alsini, R., **Ma, X.**, Soule, T., 2020. Improving the Efficiency of Genetic-based Incremental Local Outlier Factor Algorithm for Network Intrusion Detection. The 4th International Conference on Applied Cognitive Computing. Las Vegas, NV, USA. In press.
2. *Alsini, R., *Alghushairy, O., **Ma, X.**, Soule, T., 2020. A Grid Partition-based Local Outlier Factor for Data Stream Processing. The 4th International Conference on Applied Cognitive Computing. Las Vegas, NV, USA. In press.
3. *Alghushairy, O., *Alsini, R., **Ma, X.**, Soule, T., 2020. A Genetic-Based Incremental Local Outlier Factor Algorithm for Efficient Data Stream Processing. *Proceedings of the ICCDA 2020 Conference, San Jose, CA.* pp. 38-49. doi: 10.1145/3388142.3388160.
4. *Mou, X., Jamil, H., **Ma, X.**, 2017. VisFlow: A visual database integration and workflow querying system. *Proceedings of the 33rd IEEE International Conference on Data Engineering (ICDE 2017).* San Diego, CA, USA. 2pp. [Finalist of Demo Paper Track]
5. *Wang, H., *Zheng, J.G., **Ma, X.**, Fox P., Ji, H., 2015. Language and Domain Independent Entity Linking with Quantified Collective Validation. *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP2015).* 10 pp. [Best Paper Nomination]
6. Wyborn, L., Cox, S., Hudson, S., **Ma, X.**, 2018. The role of the International Science Council and CODATA in Enabling Global Transdisciplinary Integration of Data in Support of New Research Horizons. *International Data Week 2018, Gaborone, Botswana.* 3pp.
7. **Ma, X.**, 2015. Geoinformatics in the Semantic Web. In: Schaeben, H., Delgado, R.T., van den Boogaart, K.G., van den Boogaart, R. (eds.) *Proceedings of IAMG 2015, Freiberg, Germany,* pp 18-26. [Andrei B. Vistelius Award Invited Article]

8. Tilmes, C., Wolfe, R.E., Duggan, B., Aulenbach, S., Goldstein, J.C., **Ma, X.**, Zednik, S., 2015. Supporting Trust with Provenance of the Findings of the National Climate Assessment. In: Proceedings of the Method Workshop at ISWC 2015, Bethlehem, PA. 4 pp.
9. **Ma, X.**, West, P., Erickson, J., Zednik, S., *Chen, Y., *Wang H., *Zhong H., Fox, P., 2015. From data portal to knowledge portal: Leveraging semantic technologies to support interdisciplinary studies. In: Proceedings of the Diversity++ Workshop at ISWC 2015, Bethlehem, PA. 6 pp.
10. **Ma, X.**, *Chen, Y., *Wang, H., Erickson, J.S., West, P., Fox, P., 2014. Deep Carbon Virtual Observatory: A cyber-enabled platform for linked science. In: Proceedings of SciDataCon2014, New Delhi, India, 3 pp.
11. **Ma, X.**, Carranza, E.J.M., Wu, C., van der Meer, F.D., 2011. Practicing an ontology spectrum for geological data interoperability. In: Proceedings of IAMG 2011, Salzburg, Austria, 14 pp.
12. **Ma, X.**, Carranza, E.J.M., van der Meer, F.D., Wu, C., 2010. Integrating data-flow analysis and object-oriented analysis for compositing of borehole metal-grade intervals. In: Proceedings of IAMG 2010, Budapest, Hungary, 9 pp.
13. Liu, G., Wu, C., **Ma, X.**, Wang, Y., Tian, F., 2009. Approach for interoperability of multi-source geological hazard data based on ontology and GeoSciML. In: Proceedings of Geoinformatics'09, Fairfax, USA, 7 pp.
14. **Ma, X.**, Wu, C., Wang, K., Zhang, X., 2007. Point-source database theory and its application in database architecture design of Digital Mine. In: Proceedings of IAMG2007 conference, Beijing, China, pp. 421–424.
15. Guo, Y., **Ma, X.**, Wang, K., Xue, B., 2007. Research and application of urban water distribution network management information system based on GIS. In: Proceedings of IAMG2007 conference, Beijing, China, pp. 355-358.
16. Wang, K., **Ma, X.**, Wang, X., Hu, S., 2007. Data dictionary based design of land change investigation database management system. In: Proceedings of IAMG2007 conference, Beijing, China, pp. 454–457.
17. Wang, X., Chen, Y., Xia, Q., Wang, Y., Ju, F., **Ma, X.**, Zuo, R., 2007. Design and developing of basic database for resources evaluation of national important mineral zones of China. In: Proceedings of IAMG2007 conference, Beijing, China, pp. 314–318.
18. **Ma, X.**, Wu, C., Zhang, D., Wang, K., 2006. The integrated application of kriging method and 3D-GIS in Digital Mine. In: Proceedings of IAMG2006 conference, Liege, Belgium, 6 pp.
19. Wang, K., Cheng, Q., **Ma, X.**, 2006. Efficient utilization of GIS and spatial statistics achieved by using spatial weighting statistics method. In: Proceedings of IAMG2006 conference, Liege, Belgium, 6 pp.
20. **Ma, X.**, Wu, C., Wang X., Chen, Y., Wang, Y., 2005. Centralized management approach and database development of multisource geoscientific information. In: Proceedings of IAMG2005 conference, Toronto, Canada, pp. 1006–1011.
21. Wang, X., Zhao, W., Zuo, R., **Ma, X.**, 2005. Three-related geology observing point model in computer-aided regional geological survey. In: Proceedings of IAMG2005 conference, Toronto, Canada, pp. 917–922.

Edited Books and Journal Special Issues

1. **Ma, X.**, Fox, P., Narock, T., Wilson, B., (Eds.) 2015. Semantic e-Science. Special Issue of Earth Science Informatics, Volume 8, Issue 1, 146 pp.

Peer Reviewed/Evaluated:

Peer-Reviewed Book Chapters and Books (sub-total: 10 as first author; 10 as corresponding author)

1. *Althbiti, A., **Ma, X.**, 2020. Machine Learning. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. In Press.
2. *Althbiti, A., **Ma, X.**, 2019. Collaborative Filtering. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. 5pp. In Press. https://doi.org/10.1007/978-3-319-32001-4_274-1
3. *Alowairdhi, A., **Ma, X.**, 2019. Data Brokers and Data Services. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. 5pp. In Press. https://doi.org/10.1007/978-3-319-32001-4_298-1
4. *Alghushairy, O., **Ma, X.**, 2019. Data Storage. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. 5pp. In Press. https://doi.org/10.1007/978-3-319-32001-4_323-1
5. *Alsini, R., **Ma, X.**, 2019. Data Streaming. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. 5pp. In Press. https://doi.org/10.1007/978-3-319-32001-4_324-1
6. *Alshamrani, R., **Ma, X.**, 2019. Deep Learning. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. 5pp. In Press. https://doi.org/10.1007/978-3-319-32001-4_533-1
7. *Wang, C., **Ma, X.**, 2019. Text Mining to Facilitate Domain Knowledge Discovery. In: Mouatasim, A.E., (ed.) Text Mining - Analysis, Programming and Application. IntechOpen, London. In Press. [open access] <https://dx.doi.org/10.5772/intechopen.85362>

8. **Ma, X.**, 2018. Spatial Data. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. 5pp. In Press. http://dx.doi.org/10.1007/978-3-319-32001-4_192-1
9. **Ma, X.**, 2018. Metadata. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. 5pp. In Press. http://dx.doi.org/10.1007/978-3-319-32001-4_135-1
10. **Ma, X.**, 2018. Visualization. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. 5pp. In Press. http://dx.doi.org/10.1007/978-3-319-32001-4_202-1
11. **Ma, X.**, 2018. Data Repository. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. 5pp. In Press. http://dx.doi.org/10.1007/978-3-319-32001-4_59-1
12. **Ma, X.**, 2018. Data-Information-Knowledge-Action Model. In: Schintler, L.A., McNeely, C.L. (eds.) Encyclopedia of Big Data. Springer, Cham, Switzerland. 5pp. In Press. http://dx.doi.org/10.1007/978-3-319-32001-4_64-1
13. **Ma, X.**, 2018. Data Science for Geoscience: Leveraging Mathematical Geosciences with Semantics and Open Data. In Sagar, B.S.D., Cheng, Q., Agterberg, F.D. (eds.) Handbook of Mathematical Geosciences: Fifty Years of IAMG. Springer, Cham, Switzerland. pp. 687-702. [open access | invited article]
14. **Ma, X.**, Beaulieu, S.E., *Fu, L., Fox, P., Di Stefano, M., West, P., 2017. Documenting Provenance for Reproducible Marine Ecosystem Assessment in Open Science. In: Diviacco, P., Glaves, H.M., Leadbetter, A. (eds.) Oceanographic and Marine Cross-Domain Data Management for Sustainable Development. IGI Global, Hershey, PA, USA, pp. 100-126.
15. **Ma, X.**, *Fu, L., Fox, P., Liu, G., 2016. An integrated golden spike information portal enabled by data visualization and semantic web technologies. In: Raju, N.J. (ed.) Geostatistical and Geospatial Approaches for the Characterization of Natural Resources in the Environment. Springer, Cham, Switzerland, pp. 829-833.
16. **Ma, X.**, *Chen, Y., *Wang, H., *Zheng J.G., *Fu, L., West, P., Erickson, J.S., Fox, P., 2015. Data visualization in the Semantic Web. In: Narock, T., Fox, P., (eds.) The Semantic Web in Earth and Space Science: Current Status and Future Directions. IOS Press, Berlin. pp. 149–167. [invited article]
17. Wu, C., Liu G., Tian, Y., Mao, X., He, Z., Zhang, X., Liu, J., Weng, Z., Zhang, Z., Li, X., Li, Z., Xu, K., Kong, C., Li, X., Qi, G., **Ma, X.**, 2014. An Outline of Geological Information Science and Technology. Science Press, Beijing, China. 521 pp. [in Chinese]
18. **Ma, X.**, 2011. Ontology Spectrum for Geological Data Interoperability. PhD thesis, University of Twente, Enschede, The Netherlands, 184 pp. ISBN: 978-90-6164-323-4.

Peer-Reviewed Conference/Workshop Presentations

1. Wang, C., Hazen, R.M., Cheng, Q., Stephenson, M.H., Zhou, C., Fox, P., Shen, S., Oberhansli, R., Hou, Z., **Ma, X.**, Feng, Z., Fan, J., *Ma, C., Hu, X., Luo, B., Wang, G., Schiffries, C., 2020. The Deep-time Digital Earth Program: Data-driven Discovery in the Geosciences. AGU Fall Meeting 2020.
2. **Ma, X.**, *Ma, C., *Kale, A., *Crump III, R., 2020. Approaches to improve semantic description and reasoning capability in the deep time knowledge base. GSA 2019 Annual Meeting. [Invited Presentation]
3. *Ma, C., **Ma, X.**, *Kale, A., *Crump III, R., 2020. Knowledge graphs for global and regional geologic time scales and an associated R package. AGU Fall Meeting 2020.
4. **Ma, X.**, *Ma, C., 2020. Deep Time Knowledge Base: Improving Data Interoperability and Facilitating Reproducible Workflows. NSF CSSI PI Meeting, Seattle, WA. Lightning Talk and Poster.
5. *Ma, C., **Ma, X.**, Que, X., 2020. Deep-time Climate Database and Tailored Spatio-temporal Tools. ESIP Winter Meeting 2020. Bethesda, MD. Poster.
6. Morrison, M.M., *Eleish, A., *Prabhu, A., Narkar, S., *Pan, F., *Huang, F., Fox, P., Hystad, G., Liu, C., Buongiorno, J., Zhang, S., **Ma, X.**, Ralph, J., Krivovichev, S.V., Giovannelli, D., Runyon, S.E., Hummer, D., Golden, J.J., Downs, R.T., Hazen, R.M., 2019. Exploring carbon mineralogy and mineral evolution through deep time with advanced analytics and visualization. AGU Fall Meeting 2019, San Francisco, CA, USA.
7. Hazen, R.M., Morrison, M.M., Zhang, S., Boujibar, A., *Prabhu, A., Fox, P., *Eleish, A., *Huang, F., Liu, C., *Ma, C., **Ma, X.**, Large, R.R., Gregory, D., Howell, S., Nittler, L.R., 2019. Data-driven discovery in mineralogy: Insights from natural kind clustering. AGU Fall Meeting 2019, San Francisco, CA, USA.
8. *Wang, C., **Ma, X.**, Chen, J., 2019. Text Mining to Facilitate Geoscience Knowledge Discovery. AGU Fall Meeting 2019, San Francisco, CA, USA.
9. **Ma, X.**, 2019. Deep Time Knowledge Base: Facilitate Data Integration through Machine-Readable Geologic Time Concepts. Deep Carbon 2019 Conference, Washington, DC. Poster.
10. **Ma, X.**, 2019. Data visualization in mineral evolution studies. GSA 2019 Annual Meeting, Phoenix, AZ, Oral Presentation. [INVITED]
11. Morrison, M.M., *Eleish, A., *Prabhu, A., Narkar, S., *Pan, F., *Huang, F., Fox, P., Zhang, S., Howell, S., **Ma, X.**, Ralph, J., Golden, J.J., Downs, R.T., Hazen, R.M., 2019. Characterizing carbon mineralogy and formational

- environments through deep time with advanced analytics and visualization. GSA 2019 Annual Meeting, Phoenix, AZ, Oral Presentation.
12. **Ma, X.**, 2019. A knowledge base of deep time to assimilate multi-disciplinary datasets in the study of co-evolving geosphere and biosphere. IAMG 2019 Annual Meeting, State College, PA, Oral Presentation.
 13. *Que, X., **Ma, X.**, 2019. Fast geographically weighted regression for large scale spatiotemporal data. ESIP 2019 Summer Meeting, Tacoma, WA. Poster.
 14. *Ma, C., **Ma, X.**, Que, X., 2019. Deep time climate data. ESIP 2019 Summer Meeting, Tacoma, WA. Poster.
 15. **Ma, X.**, *Ma, C., 2019. Towards a machine-readable knowledge base of deep time: challenges, current progress, and future work. ESIP 2019 Summer Meeting, Tacoma, WA. Poster.
 16. *Alowairdhi, A., **Ma, X.**, 2019. Towards an implementable framework of FAIR principles for Earth science data management and stewardship. ESIP 2019 Summer Meeting, Tacoma, WA. Poster.
 17. **Ma, X.**, 2019. Using a three-dimensional Klee diagram to show co-relationships among minerals and elements. Research Computing and Data Science Symposium, Moscow, ID. Poster Presentation and Demo.
 18. *Aljohani, A., *Althbiti, A., *Alshamrani, R., **Ma, X.**, 2019. Payment methods preference predication. Research Computing and Data Science Symposium, Moscow, ID. Poster Presentation.
 19. *Alghushairy, O., *Alsini, R., **Ma, X.**, Soule, T., 2019. Genetic Algorithm-based local outlier detection in data stream mining. Research Computing and Data Science Symposium, Moscow, ID. Poster Presentation.
 20. *Alowairdhi, A., **Ma, X.**, 2019. Towards an implementable framework of FAIR principles for Earth science data management and stewardship. Research Computing and Data Science Symposium, Moscow, ID. Poster Presentation.
 21. *Althbiti, A., *Alshamrani, R., *Aljohani, A., **Ma, X.**, 2019. Prediction of the classes of Arabic idioms from rating records. Research Computing and Data Science Symposium, Moscow, ID. Poster Presentation.
 22. *Althbiti, A., *Alshamrani, R., *Aljohani, A., **Ma, X.**, 2019. Personalized course recommender system based on content approach. Research Computing and Data Science Symposium, Moscow, ID. Poster Presentation.
 23. *Alshamrani, R., *Althbiti, A., *Aljohani, A., **Ma, X.**, 2019. Leveraging early indicators for evaluating students' final grades. Research Computing and Data Science Symposium, Moscow, ID. Poster Presentation.
 24. *Alowairdhi, A., **Ma, X.**, 2019. Towards an implementable framework of FAIR principles for Earth science data management and stewardship. US2TS2019: The Second U.S. Semantic Technologies Symposium, Durham, NC. Poster Presentation.
 25. *Althbiti, A., **Ma, X.**, 2019. Semantic prediction of the attribute of Arabic idioms from rating records. US2TS2019: The Second U.S. Semantic Technologies Symposium, Durham, NC. Poster Presentation.
 26. *Alshamrani, R., **Ma, X.**, 2019. Predicting Students' final outcomes by analyzing early indicators. US2TS2019: The Second U.S. Semantic Technologies Symposium, Durham, NC. Poster Presentation.
 27. **Ma, X.**, 2019. A Method for Concept and Attribute Versioning in the Geologic Time Ontology. US2TS2019: The Second U.S. Semantic Technologies Symposium, Durham, NC. Oral Presentation.
 28. **Ma, X.**, 2019, Geo-Data Science: Leveraging Geoscience Research with Geoinformatics, Semantics and Open Data. International Forum on Deep-time Digital Earth (DDE) Big Science Program, Beijing, China. [Plenary Keynote Talk – 25 minutes]
 29. Roever, C., Sheneman, L., Blair, C., **Ma, X.**, Bogar, A., 2018. Using Graph Networks to Manage Cross-institution, Cross-discipline Research Programs, Science of Team Science Conference (SciTS 2018), Galveston, TX, USA. Poster [SciTS Meritorious Contribution Award]
 30. *Zhong, H., Huang, F., *Prabhu, A., *Pan, F., *Eleish, A., **Ma, X.**, Fox, P.A., Keck DTDI Team, 2018. The Analytics Pipeline: Data Acquisition the Information Era. The 4D Workshop: Deep-time Data Driven Discovery and the Evolution of Earth, Washington, DC, USA. Poster Presentation.
 31. Huang, F., *Zhong, H., *Eleish, A., *Prabhu, A., *Pan, F., **Ma, X.**, Hao, J., Fox, P.A., Keck DTDI Team, 2018. The Analytics Pipeline: Data Processing and Preparation. The 4D Workshop: Deep-time Data Driven Discovery and the Evolution of Earth, Washington, DC, USA. Poster Presentation.
 32. **Ma, X.**, Fox, P., Hazen, R., Hummer, D., Golden, J., Downs, R., Hystad, G., Muscente, A.D., 2018. A Justification on the Need to Build a Machine-Readable Knowledge Base of Deep Time. The 4D Workshop: Deep-time Data Driven Discovery and the Evolution of Earth, Washington, DC, USA. Poster Presentation.
 33. Golden, J.J., Pires, A.J., Rolf, J., Hystad, G., Morrison, S.M., **Ma, X.**, Hummer, D., Liu, C., Downs, R.T., Hazen, R.M., 2018. The Mineral Evolution Database and data model derived visualizations. The 4D Workshop: Deep-time Data Driven Discovery and the Evolution of Earth, Washington, DC, USA. Poster Presentation.
 34. *Prabhu, A., Fox, P.A., *Zhong, H., *Eleish, A., **Ma, X.**, Zednik, S., Morrison, S.M., Moore, E.K., Muscente, D., Meyer, M., Hazen, R.M., 2017. Visualizing Complex Environments in the Geo- and BioSciences. AGU Fall Meeting 2017, New Orleans, LA, IN31D-02.

35. *Zhong, H., **Ma, X.**, *Prabhu, A., *Eleish, A., *Pan, F., Parsons, M.A., Ghiorso, M.S., West, P., Zednik, S., Erickson, J.E., *Chen, Y., *Wang, H., Fox, P.A., 2017. Thermodynamic Data Rescue and Informatics for Deep Carbon Science. AGU Fall Meeting 2017, New Orleans, LA, Poster IN23D-0115.
36. **Ma, X.**, 2017. Doing geoinformatics with a web of data. GSA Annual Meeting, Seattle, WA, USA.
37. **Ma, X.**, Fox, P., *Kolankowski, S., Hummer, D., Hazen, R.M., Golden, J.J., Meyer, M., 2017. Leveraging Data Science for Geoscience: Experience from the Deep Time Data Infrastructure. AbSciCon2017, Mesa, AZ, USA. [INVITED]
38. Morrison, S.M., Downs, R.T., Golden, J.J., Pires, A.J., Fox, P.A., **Ma, X.**, Zednik, S., *Eleish, A., *Prabhu, A., Hummer, D., Liu, C., Meyer, M., Ralph, J., Hystad, G., Hazen, R.M., 2016. Exploiting mineral data: applications to the diversity, distribution, and social networks of copper mineral. AGU Fall Meeting, San Francisco, CA, USA.
39. *Kolankowski, S., Fox, P., **Ma, X.**, *Prabhu, A., 2016. Deep Time Data Infrastructure: Integrating our current geologic and biologic databases. AGU Fall Meeting, San Francisco, CA, USA.
40. **Ma, X.**, 2016. Semantic eScience: Leveraging Informatics and Semantic Web for Science. Idaho EPSCoR Annual Meeting, Coeur d'Alene, ID.
41. Hummer, D.R., Hazen, R.M., **Ma, X.**, Golden, J.J., Downs, R.T., Liu, C., Morrison, S.M., Meyer, M., 2016. Quantifying and visualizing earth's mineral chemistry through geologic time. GSA Annual Meeting, Denver, Colorado, USA.
42. Morrison, S.M., Downs, R.T., Golden, J.J., Pires, A.J., Fox, P., **Ma, X.**, Zednik, S., *Eleish, A., *Kolankowski, S., Hummer, D., Liu, C., Meyer, M., Ralph, J., Hystad, G., Hazen, R.M., 2016. Social network of copper minerals: a mineral ecology study. GSA Annual Meeting, Denver, Colorado, USA.
43. *Kolankowski, S., Fox, P., **Ma, X.**, Zednik, S., 2016. Deep Time Data Infrastructure: integrating our current geologic and biologic databases. GSA Annual Meeting, Denver, Colorado, USA.
44. **Ma, X.**, Hummer, D., Hazen, R.M., Golden, J.J., Fox, P., Meyer, M., 2016. Showing co-relationships between elements and minerals in a three-dimensional matrix. GSA Annual Meeting, Denver, Colorado, USA.
45. Meyer, M., Downs, R.T., Falkowski, P.G., Fox, P., Hazen, R.M., Knoll, A.H., Sverjensky, D.A., Golden, J.J., Hao, J., Hystad, G., Hummer, D., Jelen, B., *Kolankowski, S., Liu, C., **Ma, X.**, Moore, E.K., Morrison, S.M., Muscente, A.D., Pires, A.J., Zednik, S., *Zhong, H., 2016. The co-evolution of the geo- and biospheres: an integrated program for data-driven, abductive discovery in the earth sciences. GSA Annual Meeting, Denver, Colorado, USA.
46. Morrison, S.M., Downs, R.T., Golden, J.J., Pires, A.J., Fox, P., **Ma, X.**, Zednik, S., *Eleish, A., *Kolankowski, S., Liu, C., Hummer, D., Meyer, M., Ralph, J., Hystad, G., Hazen, R.M., 2016. Mineral Ecology: social network analysis and sociograms of mineral connections, distributions, and segmentation. GSA Annual Meeting, Denver, Colorado, USA.
47. Hummer, D., Hazen, R., **Ma, X.**, Golden, J., Downs, R., 2016. Constraints on the Mineral Evolution of Planetary Crusts Using Statistical Correlations and Anti-Correlations Among the Mineral-Forming Elements. Goldschmidt 2016, Yokohama, Japan. Abstract No. 1207.
48. **Ma, X.**, *Zheng, J.G., *Wang, H., Fox, P., 2015. Illuminate Knowledge Elements in Geoscience Literature. AGU Fall Meeting 2015, San Francisco, CA. Oral presentation. [INVITED]
49. *Kolankowski, S.M., Fox, P., **Ma, X.**, 2015. Database Integration: An Initial Step Towards the Deep-Time Data Infrastructure. AGU Fall Meeting 2015, San Francisco, CA. Poster.
50. West, P., Zednik, S., Fu, L., **Ma, X.**, Fox, P., 2015. Determining Fitness-For-Use of Ontologies Through Change Management, Versioning and Publication Best Practices. AGU Fall Meeting 2015, San Francisco, CA. Poster.
51. **Ma, X.**, Erickson, J.S., West, P., Zednik, S., Fox, P., 2015. Semantic Specification of Data Type Information in the Deep Carbon Observatory Data Portal. AGU Fall Meeting 2015, San Francisco, CA. Poster.
52. *Kolankowski, S.M., **Ma, X.**, Fox, P., 2015. Deep-Time Data Infrastructure: Integrating Our Current Geologic Databases. GSA 2015: Annual Meeting of the Geological Society of America 2015, Baltimore, MD. Poster.
53. **Ma, X.**, Erickson, J.S., West, P., Zednik, S., Fox, P., DCO-DS team, 2015. Adoption of RDA DTR and PID in the Deep Carbon Observatory Data Portal. RDA Sixth Plenary Meeting, Paris, France. Oral Presentation.
54. **Ma, X.**, *Zheng, J.G., 2015. Linking Geoscience Entity Mentions to the Web of Data. ESIP Summer Meeting 2015, Pacific Grove, CA. Poster.
55. **Ma, X.**, 2015. Space and Time in Geology: Modeling and Encoding. Vespucci Institute 2015: Spatial ontologies for eScience. Bar Harbor, ME. Oral Presentation.
56. **Ma, X.**, Erickson, J.S., West, P., Zednik, S., Fox, P., *Wang, H., *Chen, Y. 2015. Formal Specification of Data Types in the Deep Carbon Observatory Data Portal. DCO International Science Meeting 2015, Munich, Germany. Poster.
57. *Wang, H., *Chen, Y., West, P., Erickson, J.S., **Ma, X.**, Fox, P. 2015. Beyond a Data Portal: A Collaborative Environment for the Deep Carbon Science Communities. DCO International Science Meeting 2015, Munich, Germany. Poster.

58. Fox, P., Erickson, J.S., West, P., **Ma, X.** 2015 Enabling the Science Network of DCO - Status and directions. DCO International Science Meeting 2015, Munich, Germany. Poster.
59. **Ma, X.**, Erickson, J., West, P., Zednik, S., Fox, P., 2015. Data types and persistent identifiers in the Deep Carbon Observatory Data Portal. RDA Fifth Plenary Meeting, San Diego, CA. Poster.
60. Zednik, S., **Ma, X.**, Erickson, J., West, P., Fox, P., 2015. Adoption of RDA DTR and PID in Deep Carbon Observatory Data Portal. RDA Fifth Plenary Meeting, San Diego, CA. Oral Presentation.
61. **Ma, X.**, 2014. Knowledge evolution in distributed geoscience datasets and the role of semantic technologies. AGU Fall Meeting 2014, San Francisco, CA. Oral Presentation. [INVITED]
62. *Fu, L., **Ma, X.**, West, P., Beaulieu, S., Di Stefano, M., Fox, P., 2014. Towards a common provenance model for research publications. AGU Fall Meeting 2014, San Francisco, CA. Poster.
63. Zednik, S., Fox, P., *Fu, L., West, P., **Ma, X.**, 2014. Linked Vocabulary API for the Earth Sciences Community. AGU Fall Meeting 2014, San Francisco, CA, USA, Abstract No. IN32A-07. Oral Presentation.
64. *Wang, H., *Chen, Y., West, P., Erickson, J.S., **Ma, X.**, Fox, P., 2014. DCO-VIVO: A collaborative data platform for the Deep Carbon Science Communities. AGU Fall Meeting 2014, San Francisco, CA. Poster.
65. **Ma, X.**, *Chen, Y., *Zheng J.G., *Fu, L., *Wang, H., Fox, P., 2014. Encoding meanings into maps and visualization: an example of semantically enhanced geologic map service. 2014 AAG Annual Meeting, Tampa, FL. Oral Presentation.
66. *Fu, L., **Ma, X.**, *Zheng, J., Goldstein, J., Duggan, B., West, P., Aulenbach, S., Tilmes, C., Fox, P., 2014. Ontology development for provenance tracing in National Climate Assessment of the US Global Change Research Program. EGU General Assembly 2014, Vienna, Austria. Poster.
67. *Wang, H., *Chen, Y., **Ma, X.**, West, P., Erickson, J.S., Hazen, R., Schiffries, C., Fox, P., 2014. User-aware multi-dimensional data exploration for Deep Carbon Observatory. EGU General Assembly 2014, Vienna, Austria. Poster.
68. **Ma, X.**, Fox, P., Tilmes, C., Beaulieu, S., West, P., *Fu, L., *Zheng, J. 2014. Deliberations of reusing the PROV Ontology for provenance capture in Earth and environmental sciences. ESIP 2014 Winter Meeting, Washington, DC. Poster presentation.
69. *Zheng, J., **Ma, X.**, Zednik, S., Fox, P. 2014. Semantic similarity computation and concept mapping in Earth and environmental science. ESIP 2014 Winter Meeting, Washington, DC. Poster. [INVITED]
70. **Ma, X.**, *Zheng, J.G., Goldstein, J., Duggan, B., *Xu, J., *Du, C., *Akkiraju, A., Aulenbach, S., Tilmes, C., Fox, P., 2013. Ontology development for provenance tracing in National Climate Assessment of the US Global Change Research Program. AGU Fall Meeting 2013, San Francisco, CA. Oral Presentation.
71. **Ma, X.**, Branch, D.B., Wegner, K., 2013. A justification for semantic training in data curation frameworks development. AGU Fall Meeting 2013, San Francisco, CA. Poster.
72. *Zheng, J.G., **Ma, X.**, Fox, P.A., 2013. Semantic similarity computation and concept mapping in earth and environmental science. AGU Fall Meeting 2013, San Francisco, CA. Poster.
73. *Wang, H., *Chen, Y., **Ma, X.**, Erickson, J.S., West, P., Fox, P., 2013. Semantically-enabled knowledge discovery in the Deep Carbon Observatory. AGU Fall Meeting 2013, San Francisco, CA. Poster.
74. *Chen, Y., *Wang, H., **Ma, X.**, Erickson, J.S., West, P., Fox, P., 2013. Indexable computation as a service in Deep Carbon Observatory. AGU Fall Meeting 2013, San Francisco, CA. Poster.
75. **Ma, X.**, *Zheng, J.G., Goldstein, J., Aulenbach, S., Tilmes, C., Fox, P., 2013. Ontology engineering for provenance enablement in the third National Climate Assessment. ESIP 2013 Summer Meeting, Chapel Hill, NC. Poster.
76. **Ma, X.**, Fox, P., 2013. Form interoperability to interactivity: a test of exploratory visualization with semantic web technologies. ESIP 2013 Winter Meeting, Washington, DC. [INVITED]
77. **Ma, X.**, Fox, P., 2012. Exploratory visualization of earth science data in a Semantic Web context. AGU Fall Meeting 2012, San Francisco, CA. Oral Presentation.
78. **Ma, X.**, Fox, P., 2012. Beyond an image: using ontology and visualization to enrich Web Map Service for geosciences. ESIP 2012 Summer Meeting, Madison, WI. Poster.
79. **Ma, X.**, Carranza, E.J.M., Wu, C., van der Meer, F.D., 2011. Combining ontology and data visualization techniques to generate interactive map legends for online geological maps. EGU General Assembly 2011, Vienna, Austria, Poster.
80. **Ma, X.**, 2010. Modelling and approaching pragmatic interoperability of distributed geoscience data. EGU General Assembly 2010, Vienna, Austria, Oral Presentation.
81. **Ma, X.**, Wu, C., Liu, G., 2008. Application of 3D GIS to improve the effect of kriging method in ore reserves estimation and mining. In: Proceedings abstracts of the joint annual meeting GAC-MAC-SEG-SGA, Québec, Canada, ISBN 978-1-897095-5, p. 102. Poster.

82. **Ma, X.**, Wu, C., van der Meer, F.D., Carranza, E.J.M., 2008. Standardization of data elements: a primary step for a geological and mineral ontology. In: Abstracts of the 33rd IGC International Geological Congress, Oslo, Norway, 1p. Poster.

Other:

1. *Ma, C., *Que, X., **Ma, X.**, 2019. Spatiotemporal weighted regression in geographic process. GIS Day at University of Idaho. Oral Presentation.
2. **Ma, X.**, 2019. A Knowledge Base of Deep Time to Assimilate Multi-disciplinary Datasets in the Study of Co-Evolving Geosphere and Biosphere. GIS Day at University of Idaho. Oral Presentation.
3. **Ma, X.**, 2019. Towards a machine-readable knowledge base of deep time: challenges, current progress, and future work. GIS Day at University of Idaho. Poster.
4. *Que, X., *Ma, C., **Ma, X.**, 2019. Parallel Computing of Spatiotemporal Weighted Regression for Analyzing Large Scale Data in Geospatial Processes. GIS Day at University of Idaho. Poster.
5. *Alowairdhi, A., **Ma, X.**, 2019. Toward an implementable framework of FAIR principles for Earth science data management and stewardship (Findable, Accessible, Interoperable, and Reusable). GIS Day at University of Idaho. Poster.
6. *Tang, R., Fu, M., **Ma, X.**, 2019. Spatial analysis of driving forces of karst rocky desertification. GIS Day at University of Idaho. Poster.
7. **Ma, X.**, Erickson, J., Zednik, S., West, P., Fox, P., 2015. RDA Adoption Project Report: Deploying Research Data Alliance Data Type Registry and Persistent Identifier Information Types in the Deep Carbon Observatory Data Portal. 8pp. http://tw.rpi.edu/media/latest/DTR-PIT-project_report_final.pdf
8. West, P., Fox, P., Zednik, S., **Ma, X.**, *Eleish, A., *Zhong, H., 2015. The Deep Carbon Observatory Ontology. <http://info.deepcarbon.net/schema>.
9. Tilmes, C., Fox, P., Wolfe, R., Zednik, S., **Ma, X.**, 2015. The Global Change Information System Ontology (V. 2.0). <https://data.globalchange.gov/gcis.owl>.
10. **Ma, X.**, Tilmes, C., Fox, P., 2013. The Global Change Information System Ontology (V. 1.2). <http://dx.doi.org/10.13140/2.1.3930.3045>.
11. **Ma, X.**, Beaulieu, S., Fox, P., West, P., Futrelle, J., Di Stefano, M., Fu, L., Du, C., 2014. The ECOOP Provenance Ontology. <https://github.com/tetherless-world/ecoop/blob/master/prov/ecoopProv.ttl>.
12. **Ma, X.**, 2014. Open science in an open world. ITC News Magazine, (3-4), 26–27.

Refereed/Adjudicated (currently scheduled or submitted):

1. **Ma., X.**, 2020. Big Data. Encyclopedia of Mathematical Geosciences. In Preparation.
2. **Ma., X.**, 2020. Big Data. Data Science for Geosciences: Recent Progress and Future Trends. GSA Special Paper: Recent Advancement in Geoinformatics and Data Science In Preparation.
3. **Ma, X.**, *Ma, C., Wang, C., 2020. A new structure for representing and tracking version information in a deep time knowledge graph. Under Review.
4. Cui, S., Chen, Q., Liu, G., **Ma, X.**, Que, X., 2020. Multiple-point geostatistical simulation based on conditional conduction probability. Under Review.
5. Muscente, A.D., Martindale, R.C., Prabhu, A., **Ma, X.**, Fox, P., Hazen, R.M., Knoll, A.H., 2020. Diversity and Community Dynamics in Phanerozoic Oceans. Under Review.
6. Wang, C., Hazen, R.M., Cheng, Q., Stephenson, M.H., Zhou, C., Fox, P., Shen, S., Oberhansli, R., Hou, Z., **Ma, X.**, Feng, Z., Fan, J., *Ma, C., Hu, X., Luo, B., Wang, G., Schiffries, C., 2020. The Deep-time Digital Earth Program: Data-driven Discovery in the Geosciences. Under Review.
7. *Alshamrani, R., *Althbiti, A., Alshamrani, Y., **Ma, X.**, 2020. Artificial Intelligence-augmented Decision Making in Multiple Sclerosis Research: Existing Works and Latest Trends. Under Review.
8. *Alsini, R. Almakrab, A., Ibrahim, A., **Ma, X.**, 2020. Improving the Outlier Detection Method in Concrete Mix Design by Combining Isolation Forest and Local Outlier Factor. Under Review.
9. Long, S., He, Z., **Ma, X.**, Zhao, H., 2020. A boundary distance-based symbolic aggregate approximation method for time series data. Under Review.
10. Wang, C., Zhao, K.-D., Cheng, J., **Ma, X.**, 2020. Examine the Fingerprint Trace Elements in Cassiterite for Prospecting and Exploration of Tin Deposits. In Preparation.
11. Roever, C., Blair, C., *Madhikarmi, B., *Bizimana, O., **Ma, X.**, Bogar, A., Sheneman, L., 2019. Using social network analyses to manage cross-institution and cross-discipline research programs. Under Review.
12. *Tang, R., Fu, M., **Ma, X.**, Chen, Y., Jiang, Y., Wang, L., Huang, N., 2020. Ecological Redline Delineation based on Ecological Critical Patches: A Case Study of Daye, a Mining City in China. Under Review.
13. *Ma, C., **Ma, X.**, *Que, X., De Vleeschouwer, D., Wang, M., 2019. Integrating age models of the Green River Formation using multiple clocks: an improved Bayesian algorithm with parallel computing. Under Review.

14. Ding, B., Li, Q., **Ma, X.**, Hu, K., Liu, H, Qi, X., 2019. An approximate estimation and geo-analysis of city complex underground space from building shadow in high-resolution remote sensing imagery Under Review.
15. Xu, K., **Ma, X.**, Liu, G., Wu, C., Kong, C., 2019. Geological hazard susceptibility evaluation based on GA-BPNN: a case study of Xingye County. Under Review.
16. *Que, X., *Ma, C., **Ma, X.**, *Chen, Q., 2019. A Spatiotemporal Weighted Regression Model for Analyzing Local Non-stationarity in Space and Time. Under Review.
17. *Que, X., *Ma, C., **Ma, X.**, *Chen, Q., 2019. Parallel Computing for Fast Spatiotemporal Weighted Regression. Under Review.
18. Wang, C., Wang, X., **Ma, X.**, Chen, J., 2020, A Digital Geological Mapping Workflow to Facilitate Practical Training of Field Geology at Zhoukoudian, China. Under Review.
19. Que, X., **Ma, X.**, Ma, C., Liu, F., Chen, Q., 2020. Spatiotemporal Weighted Regression. Encyclopedia of Mathematical Geosciences. Under review.
20. Wang, C., **Ma, X.**, 2020. Digital Geological Mapping. Encyclopedia of Mathematical Geosciences. Under review.
21. Wang, C., **Ma, X.**, 2020. Text Mining. Encyclopedia of Mathematical Geosciences. Under review.
22. *Que, X., **Ma, X.**, Ma, C., 2020. A spatiotemporal kernel function suitable for geographical and temporal weighted regression. Under review.
23. **Ma, X.**, *Madhikarmi, B.L., Hummer, D., Golden, J.J., Fox, P.A., Hazen, R.M., Morrison, S.M., Downs, R.T., Meyer, M.B., 2019. A Three-Dimensional Heat Map Matrix for Showing Co-relationships in Network Analysis. In Preparation.
24. Dong, S., Zhang, L., **Ma, X.**, Fan, J., 2019. Earth Science Knowledge Graph: Current Progress and Future Work. In Preparation.
25. *Zhong, H., **Ma, X.**, *Huang, F., Fox, P., 2019. Thermodynamic Data Legacy of Carbon-Related Minerals for Deep Carbon Science. In Preparation.
26. *Ma, C., **Ma, X.**, 2019. Quantifying Uncertainty of the Astrochronology: Honing the Digital Tools for Geological Time Scale. In Preparation.

Presentations and Other Creative Activities:

- See Non-credit Classes, Workshops, Seminars, Invited Lectures, etc. under the Teaching Accomplishments.

Grants and Contracts Awarded:

At University of Idaho

1. REU Supplement to NSF OAC CSSI #1835717, National Science Foundation, \$23,400, **PI: Ma, X.**, 06/2020-06/2021
2. A paleoclimate database. Earth Science Information Partners, \$5,000, PI: Ma, C., **Co-PI: Ma, X.**, 07/2019-01/2020
3. FAIRTool.org toward better Earth science data stewardship, Earth Science Information Partners Lab Program, \$7,000, PI: Alowairdhi, A., **Co-PI: Ma, X.**, 02/2019–08/2019
4. Grant to Support Attendees of 2019 U.S. Semantic Technologies Symposium (US2TS), Artificial Intelligence Journal, Elsevier, \$3,300, **PI: Ma, X.**, 01/2019–12/2019
5. Elements: Software: HDR: A knowledge base of deep time to facilitate automated workflows in studying the co-evolution of the geosphere and biosphere, National Science Foundation, \$596,975, **PI: Ma, X.**, 12/2018–11/2021
6. Defining the Future of the IGSN as a Global Persistent Identifier for Material Samples, \$385,633, Alfred P. Sloan Foundation, PI: Lehnert, K., co-PIs: Klump, J., Wyborn, L., **Non-paid Collaborator: Ma, X.**, et al., 08/2018-07/2020
7. Sub-grant to support cyberinfrastructure research in MILES program (2018 fall), Idaho EPSCoR, \$12,366, **PI: Ma, X.**, 08/2018–11/2018
8. Sub-grant to support cyberinfrastructure research in MILES program (2018 summer), Idaho EPSCoR, \$7,546, **PI: Ma, X.**, 05/2018–08/2018
9. U.S. Semantic Technologies Symposium, Alfred P. Sloan Foundation, \$20,000, **PI: Ma, X.**, Co-PIs: Fox, P., Narock, T., Hitzler, P., Janowicz, K., 03/2018–08/2019
10. The 4-D Workshop: Deep-Time Data-Driven Discovery and the Evolution of Earth, Alfred P. Sloan Foundation, \$115,000, PI: Hazen, R., **Non-paid Collaborator: Ma, X.**, et al., 01/2018-12/2018
11. Collecting data standards among scientific disciplines and building a catalogue, sub-award from Research Data Alliance (NSF ACI-1349002), \$5,000, **PI: Ma, X.**, 05/2017–08/2018
12. Student Support for the 2018 U.S. Semantic Technologies Symposium (US2TS), National Science

- Foundation, \$10,250, **PI: Ma, X.**, Co-PI: Hitzler, P., 12/2017–11/2018
13. Network analysis of research collaborations and outputs in MILES program, MILES Undergraduate Research and Internship (MURI) Program, Idaho EPSCoR, \$4,500, **PI: Ma, X.**, 08/2017–12/2017
 14. Sub-grant to support synthesis and data analysis in MILES program, Idaho EPSCoR, \$14,738, **PI: Ma, X.**, 08/2017–12/2017
 15. A Fresh Insight into the MILES Research Network towards Its Synthesis Stage, MILES Undergraduate Research and Internship (MURI) Program, Idaho EPSCoR, \$4,500, **PI: Ma, X.**, 05/2017–08/2017
 16. Leveraging data science to explore co-relationships between elements and minerals, UI Office of Research and Economic Development (ORED) Seed Grant, \$ 11,795.57, **PI: Ma, X.**, 05/2017–08/2018
 17. CODATA Task Group on coordinating data standards amongst scientific unions, CODATA, \$8,800, **PI: Ma, X.**, 09/2016–09/2018
 18. PI, sub-grant to support cyberinfrastructure construction in MILES program, Idaho EPSCoR, \$26,830, **PI: Ma, X.**, 01/2017–05/2017

Before Joining University of Idaho

1. Deploying Research Data Alliance Data Type Registry and Persistent Identifier Information Types in the Deep Carbon Observatory Data Portal, sub-grant from Research Data Alliance (NSF ACI-1349002), \$50,000, PI: Fox, P., **Co-PI: Ma, X.**, 02/2015–08/2015
2. An Entity Linking Service for Documents and Datasets in Earth and Environmental Sciences, Foundation for Earth Science, \$7,000, **PI: Ma, X.**, 05/2015–12/2015,
3. Deep Carbon Observatory Data Science Day, Alfred P. Sloan Foundation, \$22,300, PI: Fox, P., **Co-PI: Ma, X.**, Erickson, J., West, P., 01/2014–12/2014
4. Early Career Data Professionals Group, CODATA, €10,000, PI: Doko, T., **Co-PIs: Ma, X.**, Laughton, P., Li, S., Murillo, A., Qiu, Y., Rybkina, A., Sharif, R., Tiwari, V., 09/2014–09/2016
5. Semantic Similarity Computation and Concept Mapping in the Earth and Environmental Sciences, Foundation for Earth Science, \$3,000, PI: Zheng, J.G., **Co-PI: Ma, X.**, 07/2013–06/2013
6. Exploratory Visualization of Earth Science Data in Semantic Web, Foundation for Earth Science, \$5,000, **PI: Ma, X.**, 07/2012–06/2013
7. IAMG Student Chapter at ITC, University of Twente, International Association for Mathematical Geosciences, \$1,000, **PI: Ma, X.**, 07/2010–06/2011
8. Ontology Spectrum for Geological Data Interoperability (PhD research), ITC Research Fund, €60,000, **PI: Ma, X.**, 01/2008–11/2011
9. 3D Visualization of Geologic Bodies and Kriging Method, International Association for Mathematical Geosciences, \$2,000, **PI: Ma, X.**, 08/2006–07/2007

Honors and Awards for Research Activities:

- | | |
|--------------|---|
| 2019 | Funding Friday Award, Federation of Earth Science Information Partners |
| 2019 | Best Poster Award at the 2019 University of Idaho Computer Science Industrial Advisory Board Meeting |
| 2019 | Invited Plenary Keynote Speaker at the International Forum on Deep-time Digital Earth (DDE) Big Science Program and the 644th Session of the Xiangshan Science Conference, Deep-time Digital Earth: International Workshop on Paleogeography Reconstruction and Deep-time Big Data, Beijing, China |
| 2018 | Frontiers Spotlight Award Finalist (my paper is in one of the 10 shortlisted article collections) |
| 2018 | SciTS Meritorious Contribution Award, Science of Team Science Conference (SciTS) |
| 2017 | Finalist of Demo Paper Track, IEEE International Conference on Data Engineering (ICDE) |
| 2016–present | Travel Grants awarded: NSF-EarthCube (1), International Council for Science-CODATA (1), World Data System (1), Carnegie Institution for Science (4), UC Berkeley (1), Columbia Univ. (2), PennState Univ. (1), USGS (1), Geological Society of America (1), INL-Center for Advanced Energy Studies (1), Idaho EPSCoR program (2), Deep-time Digital Earth Program (2) |
| 2015 | Andrei B. Vistelius Research Award, International Association for Mathematical Geosciences |
| 2015 | Best Paper Nomination, Conference on Empirical Methods in Natural Language Processing, (EMNLP) |
| 2014 | Inaugural WDS Data Stewardship Award, International Council for Science-World Data System |
| 2013, 2012 | Funding Friday Award, Federation of Earth Science Information Partners |
| 2011 | Top 25 Hottest Articles (Jul.–Sept., 2011), Computers & Geosciences, Elsevier |
| 2011–2016 | Travel Grants awarded by: NSF-EarthCube (4), NSF-RDA (1), A.P. Sloan Foundation (8), W.M. Keck Foundation and Carnegie Institution for Science (3), Univ. of Oxford (1), Smithsonian Inst. |

	(1), UCLA (1), McGill Univ. (1), Univ. of Muenster (1), Ohio State Univ. (1), Google (1), IAMG (1), ESIP (1), CODATA (1), Global Young Academy (1), CUG (2)
2007	Zhongkai Scholarship (2/3,000 graduate students), China University of Geosciences
2006	Graduate Student Research Grant, International Association for Mathematical Geosciences
2006	Excellent Academic Work Award, China University of Geosciences
2005	Third Grade Prize, Challenge Cup Academic Competition, China University of Geosciences
2003	Second Grade Prize, 13th Science & Technology Conference of Students, China University of Geosciences
2002	Zijin Scholarship (6/20,000 undergraduate students), China University of Geosciences
2002	First Grade Prize, 12th Science & Technology Conference of Students, China University of Geosciences
2001	Third Grade Prize, Outstanding Academic Achievement of University Students in Hubei Province, Hubei Provincial Department of Education
2000	Huayi Scholarship (3/20,000 undergraduate students), China University of Geosciences

SERVICE:**Major Committee Assignments:***Department Services*

2019	Member, Faculty Third Year Review Committee, Department of Computer Science, University of Idaho
2018–	Member, Graduate Committee, Department of Computer Science, University of Idaho
2018	Member, Department Chair Search Committee, Department of Computer Science, University of Idaho
2017–2018	Member, New Faculty Search Committee, Department of Computer Science, University of Idaho

College Services

2019	Volunteer, 2019 University of Idaho Annual Engineering Design EXPO
2018	Member, Tenure and Promotion Review Committee, Department of Civil and Environmental Engineering, College of Engineering, University of Idaho

University Services

2019–	Member, Interdisciplinary Committee on Data Science, University of Idaho
2019–	Member, Library Affairs Committee, University of Idaho
2017–2019	Member, University of Idaho Data Science Program Initiative
2018	Judging Committee, The First Student Data Science Competition, University of Idaho
2018–	Member, Curriculum Committee of Data Analytics Certificate Program, University of Idaho
2016–	Member, Advisory Committee, Northwest Knowledge Network, University of Idaho

External Committee Services

2019–	IGSN 2040 Technical Steering Committee, Sloan-funded IGSN 2040 project
2017–2019	Member, Technical Advisory Committee, NSF-funded Interdisciplinary Earth Data Alliance, Columbia University

Before joining University of Idaho

2010	Vice-chair, Faculty Council, ITC, University of Twente, Netherlands
2010	Board Member, ITC PhD student Committee, ITC, University of Twente
2002–2004	Secretary General, Science and Technology Society of Graduate Students, China University of Geosciences, Wuhan

Professional and Scholarly Organizations:*Membership*

- ACM Special Interest Group on Hypertext and the Web (ACM SIGWEB)
- Research Data Alliance (RDA)
- International Council for Science (ICSU) - Committee on Data for Science and Technology (CODATA)
- ICSU-World Data System: Early Career Researchers and Scientists Network
- Federation of Earth Science Information Partners (ESIP)
- American Geophysical Union (AGU) - Earth and Space Science Informatics Cluster

- International Union for Geological Sciences (IUGS) - Commission for the Management and Application of Geoscience Information (CGI)
- International Association for Mathematical Geosciences (IAMG)
- Geological Society of America (GSA) - Geoinformatics Division
- Geological Society of London (GSL) - Geoscience Information Group
- Spatial Statistics Society
- Sigma Xi

Committee Assignments

2019–	Chair, Awards Committee, International Association for Mathematical Geosciences
2018	Chair, Awards and New Officer Nomination, Geoinformatics Division, Geological Society of America
2018–2020	Vice-Chair/Chair/Past Chair, Geoinformatics Division, Geological Society of America
2017–2019	Member, Awards Committee, International Association for Mathematical Geosciences
2017–	Representative of International Union of Geological Sciences to CODATA
2016–2020	Councilor, International Association for Mathematical Geosciences
2016–2018	Chair, Task Group on Coordinating Data Standards amongst Scientific Unions, CODATA
2013–2015	Member, Geoscience Terminology Workgroup, IUGS-CGI

Editorial Services

Journal and Book Editorial Service:

- Associate Editor:
 - *Computers & Geosciences (Elsevier)*, ▪ *Applied Computing & Geosciences (Elsevier)*
- Editorial Board Member:
 - *Earth Science Informatics (Springer-Nature)*, ▪ *Data Science Journal (CODATA)*, ▪ *International Journal of Information Retrieval Research (IGI)*
- Journal Guest Editor:
 - *Earth Science Informatics (2015, special issue 'Semantic e-Science')*
 - *Geoscience Data Journal (2020, special issue 'Deep Carbon Observatory Data Science')*
- Book Editor:
 - *Section Editor for Encyclopedia of Mathematical Geosciences (responsible for section on geoinformatics and data science, ~45 chapters) (anticipated publication in late 2021, Springer-Nature)*
 - *Leading Editor for Recent Advances in Geoinformatics and Data Science (21 chapters, anticipated publication in middle 2021, Geological Society of America)*

Reviewer for Journals and Books:

▪ *Future Generation Computer Systems*, ▪ *IEEE Transactions on Emerging Topics in Computing*, ▪ *Data Science Journal*, ▪ *IEEE Transactions on Knowledge and Data Engineering*, ▪ *Informatics*, ▪ *Expert Systems with Applications*, ▪ *Cluster Computing*, ▪ *Semantic Web*, ▪ *International Journal on Semantic Web and Information Systems*, ▪ *Journal of the Association for Information Science and Technology*, ▪ *Plos One*, ▪ *Geoscience Data Journal*, ▪ *International Journal of Information Retrieval Research*, ▪ *Information*, ▪ *Earth and Space Science*, ▪ *International Journal of Applied Earth Observation and Geoinformation*, ▪ *Environmental Modelling & Software*, ▪ *International Journal of Geographical Information Science*, ▪ *International Journal of Digital Earth*, ▪ *Sensors*, ▪ *ISPRS International Journal of Geo-Information*, ▪ *Computers & Geosciences*, ▪ *Computers, Environment and Urban Systems*, ▪ *Stochastic Environmental Research and Risk Assessment*, ▪ *Earth Science Informatics*, ▪ *Environmental Management*, ▪ *Transactions in GIS*, ▪ *GeoResJ*, ▪ *Geosciences*, ▪ *Geological Journal of China Universities*, ▪ *Ore Geology Reviews*, ▪ *Natural Resource Research*, ▪ *International Journal of Oil, Gas and Coal Technology*, ▪ *Book Proposal in Geoinformatics (Elsevier, 2020)*, ▪ *Spatial Cloud Computing: A Practical Approach (4 book chapters, 2013)*, ▪ *The Semantic Web in Earth and Space Science: Current Paths and Future Directions (1 book chapter, 2015)*, ▪ *Oceanographic and Marine Cross-Domain Data Management for Sustainable Development (2 book chapters)*

Reviewer for Conferences:

▪ *SciDataCon 2016 (10 abstracts)*, ▪ *AGU 2015 (Abstracts of 9 sessions)*, *AGU 2014 (38 abstracts)*, ▪ *AAG 2014 (5 abstracts)*, ▪ *AAAI 2014 (1 abstract)*, ▪ *AGU 2013 (25 abstracts)*, ▪ *Big Data in the Geosciences Workshop 2015 (1 abstract)*

Conference/Workshop Organization

- 2020 Session leader, Workshop on Earth Science meets Data Science - Services & Systems, Policies & Procedures, Tools & Techniques for Geochemistry, Goldschmidt 2020 (virtual meeting).
- 2019 Programme Committee Member, Geoinformatics in Sustainable Ecosystem and Society 2019; Geospatial Artificial Intelligence for Urban Computing 2019, Guangzhou, China
- 2019 Chair, Organizing Committee, 2019 Deep Time Data Science Mini-Workshop, Moscow, ID
- 2019 Programme Committee Member, 2019 International Congress on Big Data (BigData Congress 2019), San Diego, CA
- 2019 Programme Committee Member and Sponsorship Chair, US2TS 2019: Second U.S. Semantic Technologies Symposium, Durham, NC
- 2018 Co-convenor of one session and OSPA Judge. American Geophysical Union Fall Meeting 2018, Washington, DC
- 2018 Programme Committee of the Linked Data and Semantic Integration Track, CCKS2018: China Conference on Knowledge Graph and Semantic Computing, Tianjin, China
- 2018 Co-chair of breakout session, The 4D Workshop: Deep-time Data Driven Discovery and the Evolution of Earth, Washington, DC
- 2018 Joint Technical Program Committee, Proposer of two technical sessions. Geoinformatics Division, GSA 2018, Indianapolis, IN
- 2018 Sponsorship Chair, US2TS2018: First U.S. Semantic Technologies Symposium, Dayton, OH
- 2017 Programme Committee, K-CAP 2017: The Ninth International Conference on Knowledge Capture, Austin, TX
- 2017 Programme Committee, CCKS 2017: Chinese Conference on Knowledge Graph and Semantic Computing, Chengdu, China
- 2017 Hackathon Session Chair, The 9th ACM Web Science Conference, Troy, NY
- 2016 Co-chair of a Union Session, AGU Fall Meeting, San Francisco, CA
- 2016 Co-organizer, GeoVoCampDC2016, Washington, DC
- 2016 Programme Committee, CCKS 2016: Chinese Conference on Knowledge Graph and Semantic Computing, Beijing, China
- 2016 Programme Committee, Co-chair of a session, SciDataCon2016, Denver, CO
- 2016 Organizer of the Keck Data Science Day Symposium, Troy, NY
- 2016 Co-organizer of 1 session, International Geological Congress, Cape Town, South Africa
- 2015 Organizer of 4 sessions, Chair of 8 sessions, AGU Fall Meeting, San Francisco, CA
- 2015 Program committee, Diversity++ Workshop, 2015 International Semantic Web Conference, Bethlehem, PA
- 2015 Program chair, Big Data in the Geosciences Workshop, 2015 IEEE International Conference on Big Data, Santa Clara, CA
- 2015 Organizer of 1 session, Association of American Geographers Annual Meeting 2015, Chicago, IL
- 2015 Organizer of 2 sessions, Federation of Earth Science Information Partners Winter Meeting, Washington, DC
- 2014 Organizer of 2 sessions, SciDataCon 2014, New Delhi, India
- 2014 Organizer and convener of 2 sessions; OSPA Award liaison of two sessions; Organizer of 4 other initial sessions, American Geophysical Union Fall Meeting 2013, San Francisco, CA, USA
- 2014 Chair of organizing committee; Moderator of 2 sessions, GeoData 2014 Workshop, Boulder, CO
- 2014 Chair of organizing committee; Co-Chair of workshop, DCO Data Science Day, Troy, NY, USA
- 2014 Chair of 1 session, Association of American Geographers Annual Meeting 2014, Tampa, FL
- 2013 Organizer and co-convenor of 1 session, American Geophysical Union Fall Meeting 2013, San Francisco, CA

Grant and Award Reviews

Reviewer for Research Grant Programs:

- 2020 NSF OAC
- 2018 The Research Council of Norway
- 2016 NASA ACCESS

Reviewer/Judge for Awards and Scholarships:

- 2018– Several awards in geoinformatics and mathematical geosciences (Founders Scholarship, Andrei B. Vistelius Research Award, John C. Griffiths Teaching Award, Felix Chayes Prize, and William C. Krumbein Medal), International Association for Mathematical Geosciences

- 2018 Geoinformatics Division Outstanding Contribution Award, Geological Society of America
 2014 Computers & Geosciences Research Scholarship, Elsevier

Outreach Service:

- 2017 Selection Committee, American Geophysical Union Open API Challenge
 2016 Mentor for Highschool CS Summer Camp at Rensselaer Polytechnic Institute
 2015 Judge for Sigma Xi Highschool Student Research Showcase
 2015 Coordinator of Outstanding Student Presentation Award, Earth and Space Science Informatics Cluster of the American Geophysical Union
 2015 Mentor for Highschool CS Summer Camp at Rensselaer Polytechnic Institute
 2015 Invited speaker for the Global Young Academy Annual Meeting, Montebello, QC, Canada
 2014–2016 Invited blogger for topics on data science and semantic web, ITC Alumni Blog
 2013–2016 Key contributor to the open data portal of the Deep Carbon Observatory (DCO)
 - DCO is a 10-year (2009-2019), \$500-million global project
 - The DCO open data portal serves more than 1,000 scientists across the world and numerous visitors from the general public
 - DCO open data portal website: <https://info.deepcarbon.net/>
 2012–2015 Key contributor to the Global Change Information System (GCIS) of the U.S. Global Change Research Program (USGCRP)
 - USGCRP has an annual budget of about \$2.6 billion (<https://www.globalchange.gov/about/budget>)
 - GCIS was formally launched on May 06, 2014 at the White House (report: <https://news.ucar.edu/11647/inside-national-assessment>)
 - GCIS website: <https://data.globalchange.gov>
 - Citation of Dr. Ma's contribution: <https://data.globalchange.gov/about>
 - GCIS ontology: <https://data.globalchange.gov/gcis.owl>
 2012–2014 Judge for Fall Meeting Outstanding Student Presentation Award, American Geophysical Union
 2010–2011 Chair, IAMG Student Chapter at ITC, University of Twente
 2010– Correspondent for the International Association for Mathematical Geosciences Newsletter

Honors and Awards for Service Activities:

- 2019 Recognized Reviewer, Future Generation Computer Systems, Elsevier
 2018 Recognized Reviewer, Environmental Modelling & Software, Elsevier
 2016 Outstanding Reviewer, Computers & Geosciences, Elsevier
 2016 Outstanding Reviewer, Computers, Environment & Urban Systems, Elsevier

PROFESSIONAL DEVELOPMENT:**Teaching:**

- 2018– Workshop and Online Group on Undergraduate Data Science Pedagogy and Practice, University of California, Berkeley
 2017 Participant, Webinar Series (9 sessions, 09/12/17-11/14/17) on Data Science Undergraduate Education, The National Academies of Sciences, Engineering, and Medicine

Scholarship:

- 2020 NSF CSSI program PI meeting, Seattle, WA
 2018–2019 NSF CAREER Proposal Development Workshop series, Office of Research and Economic Development, University of Idaho
 2018 CAES/Nuclear Collaborative Research Planning Meeting, Center for Advanced Energy Studies (CAES), Idaho Falls, ID
 2017 Spring 2017 NSF Grants Conference, Louisville, KY
 2016 Proposal Development Workshop for New Faculty Members, Office of Research and Economic Development, University of Idaho
 2015 Vespucci Institute 2015 - Spatial Ontologies for e-Science, three-day boot camp, Bar Harbor, ME
 2015 NSF EarthCube-EC3: Earth-Centered Communication for Cyberinfrastructure, one-week field trip and training at Yosemite and Owens Valley, CA
 2013–2014 Preparing Future Faculty Seminar Series, Rensselaer Polytechnic Institute

Outreach:

- 2019 GIS Day, University of Idaho, Moscow, ID
- 2019 Research Computing and Data Science Symposium, Moscow, ID
- 2017 Idaho EPSCoR Annual Research Meeting, Pocatello, ID
- 2017 GIS Day, University of Idaho, Moscow, ID
- 2016 Idaho EPSCoR Annual Research Meeting, Coeur d'Alene, ID
- 2016 GIS Day, University of Idaho, Moscow, ID
- 2016 University of Idaho New Faculty Orientation, Moscow, ID

Administration/Management:

- 2016–present Work-related training about safety, security, ethics, management, responsible conduct of research, and organizational mission, University of Idaho