New Program Proposal

PhD in Data-driven Music Performance and Composition

General Information

Give a brief (1-2 paragraphs) overview of the proposed credential, including its disciplinary foundations and connections, its focus and learning objectives for students, and the specific degree (e.g. bachelors, masters, doctorate) and/or credentials (e.g. major, certificate, minor, concentrations) to be offered. This should be based largely on your descriptions in the following sections but it should be shorter than their combined length. Moreover, it should use language that is capable of communicating your ideas to audiences increasingly distant from your academic field as your proposal moves through the review process.

As a response to the undeniable rise in the importance of data, we propose an advanced degree program in music that in no way recedes from music and music-making, but that centrally relates data to music, intermedia composition, digital audio creation, sound creation, and data sonification. Within music, attention directed towards data is manifest most notably in the ways musical sounds are actuated and controlled in real-time performance situations. Instead of exerting energy into a physical body, like striking a drum or plucking a violin string, musical sounds are actuated and controlled by data input to algorithms. Because of exponential increases in computing speeds during the past 20 years, electronic music has evolved from a discipline where the actuation and control of musical sound was almost exclusively non-realtime and compositionally-centered, to a discipline that is substantially, but not exclusively, realtime and performative.

Coursework in the proposed degree program that specifically addresses and acknowledges this paradigm shift includes data-driven instrumental performance, musical performance networks, data-based instrument design and fabrication, and data sonification. The dissertation will be a creative and analytical product consisting of a text document and an original real-time electroacoustic composition for data-driven instrument(s). Because there is no widely accepted notational method for computer music, the composition will be represented as a high-definition audio/video recording of a performance of the dissertation work that will be submitted as supplemental material. The knowledge cultivated in this proposed course of study will position those who complete the degree well for successfully competing for both professional, research and academic positions. This proposed degree also relates to the proposed Master's degree in Data Science Specialization and functions as a counterpoint to it by offering coursework, not in data visualization, but in data sonification and auditory display. Because data sonification and its auditory display relates to the mapping of data produced through research, experiment, or observation, to parameters contained in sound-producing algorithms for the purpose of articulating features in the data, we imagine a degree recipient could find their ways into both academic and industry research positions.

The motivation for advancing this proposal relates to our concern for evolving our curricular studies to best address the rapidly expanding discipline of music technology. The degree program described in this proposal represents an evolution from a currently operational DMA degree that concentrates

on the performance of data-driven musical instruments to a degree program that balances performance with research. The diversification of scholarly and creative work resulting from an increase of FTE in the music technology area offers the opportunity to broaden its curricular studies. The breadth of study rebalances the degree program by enhancing profiles in data-driven composition, data sonification, artist/brand development, aesthetics and design, and cultural discourse. These changes shift the degree program from being less about musical performance to being more about academic inquiry and discourse and reflect the difference in the degree name – DMA to PhD.

Primary Proposer
Jeffrey Stolet

Home department
Music

College
Music and Dance, School of

Level
Graduate

Program Type
Doctoral degree

Primary Location
UO main campus

Program Delivery Format
Traditional classroom/lab

Does the program represent a collaboration of two or more university academic units?
No

What's your desired effective term?
Fall 2023

Relationship to Institutional Mission and Statewide Goals

How is the program connected with the UO's mission, signature strengths and strategic priorities?
The proposed degree is committed to discovery and creative and critical thinking that strives toward excellence in artistic expression. Because the degree focuses on the use of recent technologies to produce music and sound, the program will promote the creation of important cultural signatures: music that is truly of our time with the instruments anthropologically representing the cultural knowledge and values of our time. Additionally, the work related to data, data mapping, and data sonification relates to important developments occurring on the University of Oregon campus and around the world. The degree will also promote the excellence already established through the recognition our music technology faculty and students have received at international and national levels.

How will the proposal contribute to meeting UO and statewide goals for student access and diversity, quality learning, research, knowledge creation and innovation, and economic and cultural support of Oregon and its communities?
In a discipline that is substantially dominated by Caucasian males, we have cultivated a nurturing creative and educational environment that has dramatically shifted our student and faculty demographics to produce equality of opportunity for students who are traditionally underrepresented within the discipline of music technology. We will continue to work to enhance this environment that will produce additional opportunities for our students to develop and reach their full potential including special educational efforts involving travel support and guest artist visitations.

How will the proposal meet regional or statewide needs and enhance the state' capacity to:
• improve educational attainment in the region;
• respond effectively to social, economic and environmental challenges and opportunities; and
• address civic and cultural demands of citizenship?
Broadly speaking, the most widely used methods to produce music and sound are through the application of recent, computer-centric technologies. The truth of this statement extends to the radio, television, music recording, film, and video game industries. The extensiveness of technology into virtually every aspect of music and sound production makes the degree exceptionally well situated to produce graduates who will be able to contribute effectively to the social and economic challenges and opportunities of the region and the State of Oregon. Because there are few applications of technology that are more humane than to create beautiful music that reflects the world in which we live, we anticipate students of the program will develop into wonderful, contributing citizens.

Program Description

Is there a core set of required courses?
Yes

What is the core set of required courses and what is the rationale for giving these courses this prominent role? What are the central concepts and/or skills you expect students to take from the core?
The core coursework centers around performing and composing for data-driven instruments, developing and executing data-mapping strategies (transforming numerical input values to output values), or, more generally, creating mapping strategies where actions are linked to outcomes, sonifying data which maps data for analytic rather than aesthetic purposes, and developing instruments and computer-based networks for accomplishing any or all of these tasks. Students completing the degree will master data creation and data mapping strategies for the purposes of real-time musical performance, non-realtime composition, and data sonification. The primary courses include Data-driven Instrument Performance (MUP 769), Musical Performance Networks (MUS 571), SensorMusik (MUS 550), History of Electroacoustic Music (MUS 570), and Data Sonification (MUS 579).

A data-driven instrument is a musical instrument that operates in a fundamentally different way than traditional musical instruments that are predicated on an action-excitement mechanism. In these new instruments data has replaced energy's function. Whereas traditional instruments are driven by energy exerted into their physical systems, data-driven instruments replace energy's function with

data streams that are generated, through performative actions involving interfaces. Once these performance interfaces output data, that data is sculpted using customize techniques in software (data-mapping), and then passed to sound-producing algorithms which respond to the received data. This conceptual model has three parts:

1) a section where data is created or acquired through human operation of some interface device,

2) a software layer (or layers) where each generated value input to it is mapped to an output value, or where each value input to it is analyzed, and, on the basis of that analysis, new replacement data is created, and then routed as control data to

3) a sound synthesis section capable of receiving and responding to this modified data to control musical parameters in realtime.

A dissertation that forms the culminating episode of the proposed degree will be a creative and analytical product consisting of a text document and an original real-time computer music composition for data-driven instrument(s). The dissertation can be understood as being comprised of: 1) an original large-scale computer music composition of a substantial and ambitious scope that is at least fifteen minutes in duration, that is performed with a data-driven instrument, and that is documented with a high-definition audio video recording; 2) the original software that contributes to documentation of the composition and that forms an essential component to the data-driven instrument; and 3) a text document that analyzes and describes the composition and the data-driven instrument. Whether the dissertation meets these standards shall be determined by the dissertation committee.

Are there tracks or concentrations within the credential? If so, do these start from a common core or are they differentiated from the beginning?
There will be no formal tracks or concentrations in the proposed Data-driven Music Performance and Composition degree.

Course of Study

Programs are required to display their curriculum in grid format to meet degree guide specifications. Proposed curriculum should include course numbers, titles, and credit hours.

Course of Study
The proposed Data-driven Music Performance and Composition degree consists of General Degree Requirements, and Area Requirements, and Other. Additionally, there are comprehensive exam and dissertation requirements.

Course List		
Code	**Title**	**Credits**
General Degree Requirements		27-30
MUS 611	Research Methods in Music	
MUS 665	Music in the 20th Century	

Course List		
Code	**Title**	**Credits**
Artist/Brand Development Course		
Aesthetics and Design Course		
Elective Courses		
Area Requirements		
MUE 639	Pedagogy and Practicum: [Topic]	3
MUS 693	Oregon Electronic Device Orchestra	2
MUP 765	Music Performance Studies: [Topic]	24
MUS 550	Sensor Music	3
MUS 570	History of Electroacoustic Music	3
MUS 571	Musical Performance Networks	3
MUS 579	Data Sonification	4
Dissertation		18
Total Credits		87-90

General Degree Requirements – 27-30 credits:
MUS 611 Research Methods in Music (3 cr.)
MUS 665 Twentieth Century Music (3 cr.)
------ ------ Artist/Brand Development Course (selected from evolving menu of courses, 4 cr.)* ------ ------ Aesthetics and Design Course (selected from evolving menu of courses, 4 cr.)* ------ ------ Cultural Discourse Course (selected from evolving menu of courses, 4 cr.)*
------ ------ Elective Courses (9-12 cr.)

Area Requirements – 42 credits
MUE 639 Pedagogy and Practicum for Data-driven Instruments (3 cr.) MUS 693 Oregon Electronic Device Orchestra (2 cr.)
MUP 769 Data-driven Instrument Performance (24 cr., 4 cr. x 6 terms) MUS 550 SensorMusik (3 cr.)

MUS 570 History of Electroacoustic Music (3 cr.) MUS 571 Musical Performance Networks (3 cr.) MUS 579 Data Sonification (4 cr.)

Other – 0 credits:
Solo Recital and Portfolio Requirement (0 cr.)

Recital requirement – 0 credits
The solo recital requirement will be fulfilled by the presentation on the University of Oregon campus of a solo recital containing five original electroacoustic compositions to be performed with data-driven instruments that employ a variety of interface devices as the front-end to the data-driven instrument. Expected total duration will be approximately one hour.

Portfolio Requirement – 0 credits
The six works included in the digital video portfolio must be musically substantial and well-executed compositions. All of the compositions of the portfolio must have received a public performance. Only one of the portfolio compositions may include other musical performers. The videos of the six works

should be created as studio productions and not produced from recordings of live performances (except in rare cases when audience impact is vital to the work itself). The quality of the final audio/video product must be excellent.

Comprehensive Exams – 0 credits
There will be a comprehensive exam that concentrates on musical and technical areas of music technology.

Dissertation, MUS 603 – 18 credits:
The dissertation will be comprised of 1) an original large-scale computer music composition of a substantial and ambitious scope that is at least fifteen minutes in duration, that is performed with a data-driven instrument, and that is documented with a high- definition audio video recording; 2) the original software that contributes to documentation of the composition and that forms an essential component to the data-driven instrument; and 3) a text document that analyzes and describes the composition and the data-driven instrument.

Expected Learning Outcomes for Students and Means of Assessment

Only one learning outcome should be listed per row. Additional fields are added once a row has been filled.

Principle Learning Outcome (Concept or Skill)	Part of curriculum where this is introduced	Part of curriculum where this is developed	How students demonstrate mastery
We expect students to demonstrate substantial skill and knowledge related to 1) real-time performance and composition of electroacoustic music with data-driven musical instruments, 2) design and fabrication of data-driven musical instruments, 3) data-mapping strategies and techniques, 4) sound synthesis techniques, 5) data-driven instrumental performance techniques, and 6) data sonification techniques.	The above skills and knowledge will be developed and honed most especially in the following courses: • MUP 769 Data-driven Instrument Performance (6 terms) • MUS 571 Musical • Performance Networks • MUS 550 SensorMusik • MUS 570 History of Electroacoustic Music • MUS 579 Data Sonification	As above, the skills and knowledge will be developed and honed most especially in the following courses: • MUP 769 Data-driven Instrument Performance (6 terms) • MUS 571 Musical Performance Networks • MUS 550 SensorMusik • MUS 570 History of Electroacoustic Music • MUS 579 Data Sonification	In addition to successfully completing the required coursework, multi-day primary area comprehensive exams will be required. Additionally, our graduate programs require a regular regiment of presenting ones work both at the School of Music and Dance and at juried conferences in this country and around the world. Among those conferences are the International Computer Music Conference, the National Conference for the Society for Electro-Acoustic Music in the United States, the Kyma International Sound

Principle Learning Outcome (Concept or Skill)	Part of curriculum where this is introduced	Part of curriculum where this is developed	How students demonstrate mastery
			Symposium, and International Conference on New Interfaces for Musical Expression.

Explain the methods by which the learning outcomes will be assessed and used to improve curriculum and instruction.

Beyond the required coursework exist, which is rigorous and significant, the presentation and evaluation of student solo recitals and primary area comprehensive exam will provide the music technology area data upon which to reflect, and when necessary, the information to act directly to refine our curriculum and methods.

Accreditation

Is or will the program be accredited?
No

Please explain why accreditation is not being sought:
No accrediting body for this type of program exists.

Need for this Credential

The degree program described in this proposal represents an evolution from a currently operational DMA degree that concentrates on the performance of data-driven musical instruments to a more balanced degree program. The diversification of scholarly and creative work resulting from an increase of FTE in the music technology area offers the opportunity to broaden its curricular studies. The breadth of study rebalances the degree program by enhancing profiles in data-driven composition, data sonification, artist/brand development, aesthetics and design, and cultural discourse. These changes shift the degree program from being less about musical performance to being more about academic inquiry and discourse and reflect the difference in the degree name – DMA to PhD.

What is the anticipated fall term headcount over each of the next five years?

Fall Term Headcount = number of students with major declared in Fall term.
Fall 2023 – 3 Students
Fall 2024 – 4 students
Fall 2025 – 5 students
Fall 2026 – 5 students
Fall 2027 – 6 students

What are the expected degrees/certificates over the next five years.

Number of Degrees:

Year 1	Year 2	Year 3	Year 4	Year 5
0	0	0	1	1

How did you arrive at the above estimates? Please provide evidence. (e.g. surveys, focus groups, documented requests, occupational/ employment statistics and forecasts, etc.)
The degree program described in this proposal represents an evolution from a currently operational DMA degree that concentrates on the performance of data-driven musical instruments to a more balanced degree program. The diversification of scholarly and creative work resulting from an increase of FTE in the music technology area offers the opportunity to broaden its curricular studies. The breadth of study rebalances the degree program by enhancing profiles in data-driven composition, data sonification, artist/brand development, aesthetics and design, and cultural discourse. These changes shift the degree program from being less about musical performance to being more about academic inquiry and discourse and reflect the difference in the degree name – DMA to PhD.

What are the characteristics of students you expect this program to attract (e.g., resident/out-of-state/international; traditional/nontraditional; full-time/part-time)? Will it appeal to students from particular backgrounds or with specific careers in mind?
This program will be attractive to students from a variety of backgrounds and we would expect them to be full-time.

What are possible career paths for students who earn this credential? Estimate the prospects for success of graduates in terms of employment, graduate work, licensure, or other professional attainments, as appropriate.
The main objective of the proposed degree in Data-driven Music Performance and Composition is to provide students with an elegant and powerful framework to develop into substantial musical artists who create music that is truly of our time. This will centrally involve developing expert skill and knowledge related to realtime performance and composition of electroacoustic music with data-driven musical instruments, design and fabrication of data-driven musical instruments, data-driven instrumental performance techniques, and data sonification techniques. It would be my expectation that students who complete the degree will find employment in academic or research positions or in industry. Additionally, it is not far-fetched to think graduates from this program might find employment in music therapy related fields.

Describe the steps that have been taken to ensure that the proposed program(s) does not overlap other existing UO program(s) or compete for the same population of students. [Provide documentation that relevant departments or areas have been informed of the proposal and have voiced no objections.]
There are not existing UO progams that would overlap with this program or compete for the same population of students.

List any existing program(s) that are complemented or enhanced by the new major.
N/A

Program Integration And Collaboration

Are there closely-related programs in other Oregon public or private universities?
No

If applicable, explain why collaborating with institutions with existing similar programs would not take place.
No public or private institutions within the State of Oregon offer degree programs similar or comparable to the proposed degree in Data-driven Music Performance and Composition.

Describe the potential for impact on other institution's programs.
Because of the uniqueness of the proposed degree program, no impact on other institutions within the State of Oregon is expected.

Resources Required To Offer The Program Or Move To New Location

List any faculty who will have a role in this this program, indicating those who have leadership and/or coordinating roles. For each individual, indicate status with respect to tenure track (TT or NTT), rank, and full-time or part-time.

Faculty Name	Faculty Classification and Rank	FTE	Role
Jeffrey Stolet	TT – Full	1.0	Faculty
Akiko Hatakeyama	TT – Assistant	1.0	Faculty
Jon Bellona	Career NTT, Instructional, Sr. Instructor 1	0.67	Faculty

Please describe the adequacy and quality of the faculty delivering the program, including how the mix of tenure-track, career and pro tem faculty are strategically used to ensure effective delivery of the curriculum.
The faculty described above are sufficient to deliver the program as they are already delivering the program for the students in the DMA program which this is supplanting.

What is the nature and level of research and/or scholarly work expected of program faculty which will be indicators of success in those areas?
As the primary method for disseminating the new creative knowledge produced by the faculty teaching in the proposed degree program, original electroacoustic music will be presented and performed and topics related to the degree will be presented in lecture format and published in conference proceedings at the preeminent conferences and festivals in the discipline. The current faculty has an exceptional record in this arena. Among those juried conferences and festivals are the International Computer Music Conference, the National Conference for the Society for Electro-Acoustic Music in the United States, the Kyma International Sound Symposium, the International Conference on New Interfaces for Musical Expression, and Musicacoustica – Beijing.

Describe how students will be advised in the new program.
Advising will be handled by existing music technology faculty in association with the School of Music Graduate Office.

What other additional staff are needed to support this program?

In the short term, additional faculty will not be required due to this new degree, because all courses listed as part of the curriculum are presently staffed.

Are special facilities, equipment, or other resources required because of the change (e.g., unusual library resources, digital media support,
No

Financial Sustainability

What financial resources are needed to support this proposal? Identify the resources currently available as part of existing UO programs or reallocations within existing budgets. Are additional resources needed?
No additional resources are requested for this proposal. Currently 2.67 FTE are committed towards exclusively instructing music technology courses. Additionally, other School of Music and Dance faculty lines support the teaching of non-music technology course required by the degree. There are also currently existing student fees associated with courses in the music technology curricula that support the needs of these programs. Advising will be handled by existing music technology faculty in association with the School of Music Graduate Office.

Provide a plan that shows how long-term financial viability of the program is to be achieved, addressing anticipated sources of funds, the ability to recruit and retain faculty, and plans for assuring adequate library support over the long term.

Business Plan Description
Likely, no additional FTE will be requested to service the proposed degree; however, if the degree reaches such a demand that additional instructional resources are required, additional instructional support will be requested. We do not anticipate such a situation arising. Course fees are currently in place for all required classes; this will support all operational needs into the foreseeable future. Facilities are quite good and can be maintained with current resources.

Describe your plans for development and maintenance of unique resources (buildings, laboratories, technology) necessary to offer a quality program.
The School of Music and Dance provides a suite of outstanding studios for electroacoustic and new media composition that provide powerful and high-quality environments in which students learn and create. Studios are equipped with current hardware and software for technological and artistic exploration and education. Additionally, there exist student fees associated with courses in the music technology curricula. These fees help in the purchase of computers, software, and other related technologies that are central in providing an excellent creative and educational environment.

What is the targeted student/faculty ratio? (student FTE divided by faculty FTE)
Not applicable because there are no dedicated faculty for proposed new music technology major. We expect that the student/faculty ratio will remain roughly similar after initiating the proposed Data-driven Music Performance and Composition degree.

What are the resources to be devoted to student recruitment?
The music technology faculty at the School of Music and Dance perform and lecture widely, both nationally and internationally, providing an exceptional forum to attract and recruit a strong applicant pool of prospective students.

If grant funds are required to launch the program, what does the institution propose to do with the program upon termination of the grant?
Not applicable

Other Program Characteristics

Must courses be taken for a letter grade and/or passed with a minimum grade to count toward the proposed major? If so, please list the courses and the requirements of each. Although there is variation in detail, UO majors typically require that most of the courses be taken for a letter grade (not "pass/no pass") and that the grade be C- or better.
All courses counted towards the degree requirements in Data-driven Music Performance and Composition must be taken for a letter grade and passed with a grade of B- or better.

How much course overlap will be allowed to count toward both the major and some other credential a student might be earning (a minor, certificate, or another major)? If there are specific credentials with overlap limits, please list those and the limits.
There are no overlap limitations.

Does your proposal call for new courses, or conversion of experimental courses into permanent courses? If so, please list courses in the text box below and indicate when they will be submitted to UOCC for approval:
Our proposal does not call for any new courses.

Will admission to the program be limited?
Yes

Maximum enrollment:
8

Will students be required to apply for entry to this program?
Yes

What are the conditions for admission?
A masters of music degree in a field related to music technology and demonstrated skill and knowledge related to data- driven music performance and composition. Among the expertise that admission requires is accomplished musical sensibilities, developed compositional skills, and strong technical and programming skills, especially as they may relate to data-mapping and sound design.

Additional Requirements (Will Appear in Catalog)
Not Applicable

Please describe admission procedures (Will Appear in Catalog)
The admission procedure we propose is entirely in accordance with the policies and procedures currently in place for admission to doctoral music programs at the University of Oregon and the School of Music and Dance. The documents and examples of work that will be required in the application process for the proposed degree include:

(1) Résumé: attached to application for graduate admission
(2) Statement of Purpose: attached to application for graduate admission
(3) Example of Scholarly writing: attached to application for graduate admission
(4) Evidence of live performance of applicant works: attached to application for graduate admission

(5) List of creative electroacoustic music work: attached to application for graduate admission
(6) List of performances of electro-acoustic music: attached to application for graduate admission
(7) Audio or audio/video recordings that demonstrate developed abilities and technical skills in data-driven music performance and composition: submitted via the admissions file upload webpage
(8) Video recordings of data-driven instrumental compositions: submitted via the admissions file upload webpage (9) Three references: see application for graduate admission for instructions

Interview with a member of the music technology faculty, while optional, may be arranged at the request of the applicant

Residency Requirements (Will Appear in Catalog)
At least one full-time academic year, the residency year, must be completed. The year of residency is expected to be the first year after admission as the doctoral student (as specified by the UO Graduate School).