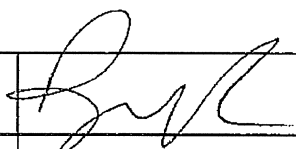
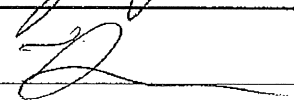



COVER SHEET FOR GRANT PROPOSALS

State Board of Education

SBOE PROPOSAL NUMBER: (to be assigned by SBOE)		AMOUNT REQUESTED: \$74,700	
TITLE OF PROPOSED PROJECT: Darwin's Demons Mobile: Expanding the Market for Evolutionary Procedural Content Generation			
SPECIFIC PROJECT FOCUS: The US video game market is expected to generate over 90 billion dollars per year by 2020. Barriers to entry into this market are very high because of the large and expensive teams required to produce increasingly complex and compelling game content. In a previous IGEM project, we developed and commercially released a tower defense game using evolutionary procedural content generation . This technique uses evolutionary models to evolve novel game content as the game progresses rather than relying on pre-programmed content. This approach was developed by Polymorphic Games, an interdisciplinary video game design studio at the University of Idaho. Evolutionary procedural content generation provides a unique competitive advantage to Polymorphic Games that positions us to produce compelling commercial games with significantly lower development costs. We have commercially released two games using this approach. Now, we seek \$74,700 to develop Darwin's Demons for mobile devices. The mobile game ecosystem is an important market for our game studio, representing a very large potential revenue source.			
PROJECT START DATE: July 1, 2019		PROJECT END DATE: June 30, 2020	
NAME OF INSTITUTION: University of Idaho		DEPARTMENT: Institute for Bioinformatics and Evolutionary Studies	
ADDRESS: Office of Sponsored Programs, 875 Perimeter Drive, MS 3020, Moscow, ID 83844-3020			
E-MAIL ADDRESS: osp@uidaho.edu		PHONE NUMBER: (208) 885-6651	
NAME:		TITLE:	
SIGNATURE:			
PROJECT DIRECTOR/PRINCIPAL INVESTIGATOR	Dr. Barrie D. Robison	Director, Institute for Bioinformatics and Evolutionary Studies	
CO-PRINCIPAL INVESTIGATOR	Dr. Terrance Soule	Department Chair, Professor, Computer Science	
NAME OF PARTNERING COMPANY: N/A		COMPANY REPRESENTATIVE NAME: N/A	
NAME:		SIGNATURE:	
Authorized Organizational Representative	Janet Nelson, Vice President for Research and Economic Development		

**DARWINS' DEMONS MOBILE: EXPANDING THE MARKET FOR EVOLUTIONARY
PROCEDURAL CONTENT GENERATION.**

- 1. INSTITUTION:** University of Idaho
- 2. PROJECT DIRECTORS:** Barrie D. Robison and Terence Soule
- 3. PRIOR INCUBATION FUNDING:** July 2017 – June 2018. \$67,600: *An*

Evolutionary Approach for Procedural Opponent Generation in Video Games.

We commercially released “Project Hastur” on May 24th, 2019, which was funded by IGEM. Project Hastur is a 3D video game that fully implemented our technique for evolutionary procedural opponent generation. This project is different because we are taking University Intellectual Property from our first game (Darwin’s Demons) and developing a version for mobile devices.

4. EXECUTIVE SUMMARY: The US video game market is expected to generate over 90 billion dollars per year by 2020. Barriers to entry into this market are very high because of the large and expensive teams required to produce increasingly complex and compelling game content. In a previous IGEM project, we developed and commercially released a tower defense game using *evolutionary procedural content generation*. This technique uses evolutionary models to evolve novel game content as the game progresses rather than relying on pre-programmed content. This approach was developed by Polymorphic Games, an interdisciplinary video game design studio at the University of Idaho. Evolutionary procedural content generation provides a unique competitive advantage to Polymorphic Games that positions us to produce compelling commercial games with significantly lower development costs. We have commercially released two games using this approach. Now, we seek \$74,700 to develop Darwin’s

Demons for mobile devices. The mobile game ecosystem is an important market for our game studio, representing a very large potential revenue source.

5. PROJECT OBJECTIVE AND BUDGET REQUEST:

Our long-term goal is to “spin-out” Polymorphic Games into an independent, commercial game studio in Moscow, ID. The studio would provide jobs to Idaho students in a booming, high tech, multibillion-dollar industry. It would publish its own games, serve as a publishing vehicle for independent student games, and develop “asset packages” to license to game companies seeking to use evolutionary procedural content generation.

Our objective is to bring a mobile game to market that uses evolutionary opponent generation. Achieving this objective would: 1) Increase the market reach of our game studio, 2) Provide a concrete example of success in the mobile market to help attract investment capital, and 3) Move us toward establishing an independent company with close ties to Idaho’s Universities. To achieve this objective, we request \$74,700.

Evidence of Prior Success: Polymorphic Games has developed two commercial games that use evolutionary procedural generation of enemies. For each game, we have shown empirically that the evolutionary component meets its intended objectives: the game gets more difficult over time and the opponents’ appearance, behavior, and traits adapt to the choices and strategy of the player.

Our first game, Darwin’s Demons (https://store.steampowered.com/app/572020/Darwins_Demons/) was designed as a critical test of our development strategy and was released commercially on the Steam platform February 13th, 2017 (the day after Darwin Day). We then used previous IGEM funding to incorporate evolutionary opponent generation into a tower defense game in

which the player builds defensive emplacements to defend against waves of opponents. Normally the opponents in a tower defense game become increasingly difficult following a fixed, programmed schedule. This limits player interest and replayability. Our evolutionary procedural generation produced a uniquely compelling and highly replayable game experience even over multiple replays. Project Hastur (https://store.steampowered.com/app/800700/Project_Hastur/) was released into early access on Darwin day of 2018, and into full release in may 2019.

6. THE MARKET OPPORTUNITY:

Ultimately, commercially successful games provide two components to their customers: **Complex and compelling content**, particularly in the appearance and behavior of the opponents, and **replayability** - which contributes to the perceived value to the player. Developing these components is expensive, usually requiring a large development team to create content and to program many alternative paths for game play. An alternative, and equally expensive approach, is to develop online games that allow humans to compete against each other. This approach particularly appeals to hardcore gamers who want the challenge of adaptable opponents rather than opponents that follow a pre-programmed script.

Our Value Proposition: Unlike any other commercial studio, Polymorphic Games uses evolution to inexpensively create complex, compelling, and replayable content. The opponents in our games evolve in response to the player's choice; the most successful opponents have the most opportunities to "reproduce," populating later stages of the game. Thus, as the game proceeds the player encounters increasingly complex and challenging opponents. When a player chooses to replay

the game using a different strategy the opponents will adapt to that strategy, creating an entirely different and uniquely challenging game play experience.

Applications, Markets, and Demand

Market Segment 1: “Gamers” Almost 200 million people play video games in North America alone and the rate of engagement in this form of entertainment is increasing rapidly. The US video game market is expected to generate over 90 billion dollars in 2020. Our technique can be applied to almost any game genre, providing a large potential user base.

Market Segment 2: “Educators and Parents” Our games are built upon accurate models of biological evolution. Thus, our games have significant potential for teaching concepts in biology, evolution, and genetics. We can market our games to middle school and high school teachers (and college professors), and to parents desiring games with educational value.

Our Competition and our Competitive Advantage: We obviously do not seek to compete (yet) with AAA game studios with billion dollar budgets. Our competition is other “indie” game design companies, ranging in size from 1 to 10 employees.

Polymorphic Games has three main competitive advantages over other indie studios: 1) Access to non-dilutive capital in the form of grants, 2) Access to highly talented student developers from a wide range of disciplines, and 3) Low overhead costs while the start up company is incubated.

Barriers to Entry: The barriers to market entry for our next game include development through the beta stage, extensive testing and refinement, and support during the first few months of commercial release. These barriers would be overcome with the proposed incubation funding.

7. TECHNOLOGY AND THE PATH TO COMMERCIALIZATION:

Our Technology: Evolutionary procedural content generation uses evolutionary algorithms to evolve game content as the game is being played. The opponents in our games are modeled as biological populations and feature a digital genome that controls their appearance and behavior. The opponents that perform the best, survive the longest, do the most damage to the player, etc. pass those genes to their offspring in the next level/wave of the game.

Market Need and Intellectual Property Status: Evolution based procedural content generation creates game content that is much more compelling than randomly generated content at a much lower cost than scripted content generated by a large development team. This approach provides a significant competitive advantage to Polymorphic Games. UI owns the Intellectual Property associated with Darwin's Demons. The technology was developed at UI by Drs Robison and Soule with funding from NSF through the BEACON Science and Technology Center (of which UI is a partner) and the Vandal Ideas Project.

8. INSTITUTIONAL SUPPORT:

UI has been extremely supportive of this project. We have space in the new Integrated Research and Innovation Center (IRIC). Our location is ideal for Polymorphic Games because it supports the interdisciplinary nature of the studio. Our project aligns with several aims of the UI Strategic Plan.

Aim 1: *Scholarly and creative productivity at the highest level, resulting in designation as a Carnegie Highest Research Activity (R1) Institution.*

Developing methods for procedural content generation in video games is a new and very active research area. However, our approach of using evolution to procedurally generate opponents is unique. Darwin's Demons and Project Hastur are the only commercial game on the market using this approach, creating many research opportunities.

***Aim 2:** Suggest and influence change that impacts societal needs, global issues, economic development and advancement of culture.*

We seek to develop a third commercial product and, more importantly, a sustainable game design company that will continue to produce new products (games and licensed software). Ideally, our project will provide positive evidence that successful video games can be developed in Idaho, rather than requiring relocation to a current hub of the video game industry.

***Aim 3:** Advance our educational impact.*

This project will develop significant human capital in Idaho. The studio experience teaches students how to work in broadly interdisciplinary and collaborative teams – a key skill in industry. The game studio will also help attract and retain Idaho students in higher education. Our studio has interacted with thousands of students, ranging from 3rd grade to incoming freshman. The response to the studio has been uniformly positive with many students expressing an increased interest in attending college and in attending the UI rather than going out of state.

UI's media center has spearheaded a number of media events leading to articles in local, state, and national news outlets. The Office of Technology Transfer has worked closely with us to develop the necessary legal and royalty agreements.

Unique Infrastructure: The broad range of technical expertise available at UI is a unique strength of Polymorphic Games. We have access to all of the expertise necessary to create successful video games (programming, design, music, business, etc.), plus access to the experts in evolutionary biology necessary for successful evolutionary content generation. This access to experts in evolutionary biology is one of the studio's key competitive advantages over other game studios.

9. COMMERCIALIZATION PARTNERS: Currently Polymorphic Games is entirely on-campus, UI based game studio and UI is the only commercialization partner.

10. SPECIFIC PROJECT PLAN:

Our purpose with this request is to **bring a mobile version of Darwin's Demons to commercial release**. Below, we describe the milestones in our development process.

Development Milestones and the Path to Commercialization

1. Initial game design and rough mock-ups. Complete.
2. Initial game prototype. Complete
3. **Recruit programmer.** Summer 2019.
4. **Acquire iOS and Android SDKs.** Summer 2019.
5. **Alpha version** – complete versions of core game elements. September 2019.
6. **Beta version** – complete versions of all game elements. Release through early access to build interest and obtain market feedback. February 2020.
7. **Pre-release version** – refined versions of all game elements. April 2020.
8. **Testing** - Quality Assurance testing prior to commercial release. May 2020.
9. **Advertising** - targeted, online advertising based on keywords in Google search, Facebook, and similar platforms. Winter - Summer 2019.

10. **Release** - Release on iOS and Android. June 2019.

11. Support and Refinement - Fix bugs, refine content, engage with user community.

Spring 2019 - Summer 2019.

Development Team: Landon Wright is the project lead for the game studio. He is an accomplished artist and has been with the studio since its inception. He will be responsible for supervising the student developers and for artistic vision of the project. We will also hire a programmer and an additional artist to assist with creating project assets. The overall project will be overseen by Drs Robison and Soule.

11. Criteria for measuring success:

Our success criteria are related to recruitment, development, and distribution. We will

recruit the team (artist and programmer) by August 2019. Development metrics include the production of a **playable beta** (Feb 2020), a **prerelease build** (April 2020), collection of **testing data** (May 2020), and **full release** (June 2020). Distribution metrics include **sales on iOS and Android** (July 2020 and beyond).

SUMMARY PROPOSAL BUDGET

Name of Institution: University of Idaho
 Name of Project Director: Barrie D Robison

A. PERSONNEL COST (Faculty, Staff, Visiting Professors, Post-Doctoral Associates, Graduate/Undergraduate Students, Other)

Name/ Title	Salary/Rate of Pay	Fringe	Dollar Amount Requested
Landon Wright, Lead Designer: Landon Wright is a recent UI graduate in Virtual Technology and Design and has worked for Polymorphic Games for the past year. Landon will oversee the development, refinement, commercial release, and support of our game. He has been an integral part of the development of our 3D procedural opponent generation.	\$37939	\$15365	\$53304
Programmer (To be recruited)	\$8000	\$712	\$8712
Artist: (To be recruited)	\$8000	\$712	\$8712

% OF TOTAL BUDGET:	94.7%	SUBTOTAL:	\$70,700
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B. EQUIPMENT: (List each item with a cost in excess of \$1000.00.)
 Item/Description
 Dollar Amount Requested

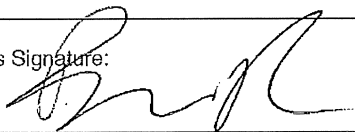
SUBTOTAL:	\$0

C. TRAVEL:
 Dates of Travel No. of Total Transportation Lodging Per Diem
 Dollar Amount Requested
 (from/to) Persons Days

Dates of Travel (from/to)	No. of Persons	Total Days	Transportation	Lodging	Per Diem
SUBTOTAL:					\$0

D. Participant Support Costs:
 Dollar Amount Requested

1. Stipends	
2. Other	
SUBTOTAL:	\$0

E. Other Direct Costs: Dollar Amount Requested	
1. Materials and Supplies	
2. Publication Costs/Page Charges	
3. Consultant Services (Include Travel Expenses)	
4. Computer Services	
5. Subcontracts	
6. Other (specify nature & breakdown if over \$1000) <i>Software:</i> Software licenses for Unity, our game development engine (\$1,500), and Adobe Creative Cloud, our art and media software (\$480). <i>Advertising:</i> We request \$2,000 to support the marketing and advertising of our game (including ads on google adwords, Facebook, and other social media outlets)	\$1980 \$2000
SUBTOTAL:	\$4000
F. Total Costs: (Add subtotals, sections A through E) TOTAL:	\$74,700
G. Amount Requested: TOTAL:	\$74,700
Project Director's Signature: 	Date: 6/21/2019

INSTITUTIONAL AND OTHER SECTOR SUPPORT (add additional pages as necessary)	
A. INSTITUTIONAL / OTHER SECTOR DOLLARS	
Source / Description	Amount
B. FACULTY / STAFF POSITIONS	
Description	
C. CAPITAL EQUIPMENT	
Description	
D. FACILITIES & INSTRUMENTATION (Description)	

APPENDICES

Appendix 1: Facilities and Equipment.

1. Polymorphic Games: Our game studio is housed in the Integrated Research and Innovation Center, a brand new building in which interdisciplinary research projects that transcend colleges are cultivated. The studio features 3 powerful workstations and 3 laptop computers for software development, and the necessary software for game development (Unity, Adobe Creative Cloud, Zbrush, etc). The studio also has two HTC Vive units and several tablets and mobile devices.
2. Institute for Bioinformatics and Evolutionary Studies (IBEST): IBEST is a Tier III Institute at the University of Idaho, and houses the administrative and technical staff to support the proposed project. This includes budget management and project oversight, as well as high performance computing and data science infrastructure. The project PI (Robison) is the Director of IBEST.

**BIOGRAPHICAL SKETCH for Barrie D. Robison
Professor, Biological Sciences**

875 Perimeter Dr MS 3051
Dept of Biological Sciences
University of Idaho
Moscow, ID 83844-3051
brobison@uidaho.edu

A. Professional Preparation

<i>Institution</i>	<i>Major or Area</i>	<i>Degree & Year</i>
Univ. Victoria	Biology	B.S., 1993
Univ. Idaho	Fisheries	M.S. 1995
Washington State Univ.	Zoology	PhD. 2000
University of Oregon	Evolutionary genetics	Postdoctoral work; 2000-2001
Indiana University	Evolutionary genetics	Postdoctoral work; 2001-2003

B. Appointments

2018 – current	Director, Institute for Bioinformatics and Evolutionary Studies
2016 – current	Professor, Department of Biological Sciences, University of Idaho.
2014 – 2018	Associate Director, Institute for Bioinformatics and Evolutionary Studies
2009 – 2016	Associate Professor, Dept of Biological Sciences, University of Idaho.
2003 - 2009	Assistant Professor, Dept of Biological Sciences, University of Idaho.

C. Products

(i) Five Most Relevant Products (* indicates corresponding author)

Terence Soule, Samantha Heck, Thomas E Haynes, Nicholas Wood, Barrie D Robison. 2017. Darwin's Demons: Does Evolution Improve the Game? Proceedings of the European Conference on the Applications of Evolutionary Computation. Springer. 435-451.

Mike Treanor, Nicholas Warren, Mason Reed, Adam M Smith, Pablo Ortiz, Laurel Carney, Loren Sherman, Elizabeth Carré, Nadya Vivatvisha, D Fox Harrell, Paola Mardo, Andrew Gordon, Joris Dormans, Barrie Robison, Spencer Gomez, Samantha Heck, Landon Wright, Terence Soule. 2017. Playable Experiences at AIIDE 2017. Proceedings, The Thirteenth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE-17). 308-313

Nicholas Wood, Terence Soule, Barrie D. Robison*, Samantha Heck, and Landon Wright. 2016. Darwin's Demons [computer software]. Published by the University of Idaho and Valve Corporation (Steam).

http://store.steampowered.com/app/572020/Darwins_Demons/

Terence Soule, Barrie D Robison, Robert B Heckendorn. 2016. Co-evolution of Sensor Morphology and Behavior. Proceedings of the 2016 Genetic and Evolutionary Computation Conference Companion. Pages 135-136.

BD Robison*, T Soule, N Wood, D Streett, and C Mirabzadeh. 2016. Implementing models of evolution in video games. Proceedings of the Games Learning Society.

(ii) Five Other Significant Publications (* indicates corresponding author)

Benner, M.J., M.L. Settles, G.K. Murdoch, R.L. Hardy, and B.D. Robison*. 2013. Sex-specific transcriptional responses of the zebrafish (*Danio rerio*) brain selenoproteome to acute sodium selenite supplementation. Physiological Genomics. 45. 653-666.

- Oswald, M.E., M.L. Singer, and B.D. Robison*. 2013. The quantitative genetic architecture of the bold shy continuum in zebrafish. *PLoS ONE* 8(7): e68828.
- Drew, R.E., Settles, M.L, Churchill, E.J., Williams, S., Balli, S., and Robison, B.D*. 2012. Brain transcriptome variation among behaviorally distinct strains of zebrafish. *BMC Genomics* 13(1) 323.
- Oswald, M.E., Drew, R.E., Racine, M., Murdoch, G., and Robison B.D*. 2012. Is variation along the bold shy continuum associated with variation in the stress axis in zebrafish? *Physiological and Biochemical Zoology*, 85(6) 718 – 728.
- Moretz J.A., E.P. Martins & B.D. Robison. 2007. Behavioral syndromes and the evolution of correlated behavior in zebrafish. *Behavioral Ecology*. 18 (3): 556-562.

D. Synergistic Activities

- i. Member, Society for the Study of Evolution Education Committee
- ii. Co-organizer, 2009 Conference of the Society for the Study of Evolution (Moscow, ID)
- iii. Member, Higher Education Video Games Alliance
- iv. Consultant, "Math Fire" – a game designed to teach young children number sense and mathematics.

Current and Pending Support: [Barrie Robison, University of Idaho]

Support: Current

None

Support: Pending

Project/Proposal Title: Darwin's Demons Mobile: Expanding the Market for Evolutionary Procedural Content Generation [this proposal]

Source of Support: Idaho State Board of Education

Total Award Amount: \$74,700

Total Award Period Covered (start date to end date): July, 2019 – June, 2020

Location of Project: Moscow, Idaho

Person-Months per Year Committed to the Project: Cal: 0

Project/Proposal Title: Harnessing the Data Revolution to Enhance Economic Growth in Idaho

Source of Support: National Science Foundation

Total Award Amount: \$1,954,025

Total Award Period Covered (start date to end date): July 1, 2019 – June 31, 2022

Location of Project: Moscow, Idaho

Person-Months per Year Committed to the Project: Cal: 1

Project/Proposal Title: THE EVOLUTIONARY ARCADE: A game based context for informal learning of evolutionary biology [This proposal]

Source of Support: National Science Foundation

Total Award Amount: \$2,400,094

Total Award Period Covered (start date to end date): August 1, 2019 – August 1, 2024

Location of Project: Moscow, Idaho

Person-Months per Year Committed to the Project: Cal: 1

Terence Soule
Professor of Computer Science
University of Idaho, JEB 229, Moscow, ID, 83844
(208)-885-7789; tsoule@cs.uidaho.edu

Professional Preparation

Reed College	Physics	B.A., 1991
Washington State University	Physics	M.S., 1994
University of Idaho	Computer Science	Ph.D., 1998

Appointments

Chair, Computer Science, University of Idaho 2018 - present
Professor, Computer Science, University of Idaho 2013 – present
Director, Neuroscience Program, University of Idaho, 2009 - 2012
Associate Professor, Computer Science, University of Idaho, 2006 – 2013
Assistant Professor, Computer Science, University of Idaho, 2000 - 2006
Assistant Professor, Computer Science, St. Cloud State University, 1998 – 2000

Products

Five Products Related to this Proposal

1. Nicholas Wood, Terence Soule, Barrie D. Robison, Samantha Heck, and Landon Wright. 2016. Darwin's Demons [commercial software]. Published by the University of Idaho and Valve Corporation (Steam). http://store.steampowered.com/app/572020/Darwins_Demon.
2. Soule, Terence and Heck, Samantha and Haynes, Thomas E and Wood, Nicholas and Robison, Barrie, Darwin's Demons: Does Evolution Improve the Game?, European Conference on the Applications of Evolutionary Computation, 435-451, 2017.
3. Mike Treanor, Nicholas Warren, Mason Reed, Adam M Smith, Pablo Ortiz, Laurel Carney, Loren Sherman, Elizabeth Carré, Nadya Vivatvisha, D Fox Harrell, Paola Mardo, Andrew Gordon, Joris Dormans, Barrie Robison, Spencer Gomez, Samantha Heck, Landon Wright, Terence Soule. Playable Experiences at AIIDE 2017. Proceedings, the 13th AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE-17). 308-313, 2017.
4. Amador, Julie and Soule, Terence, "Girls Build Excitement for Math from Scratch", Mathematics Teaching in the Middle School, 20:7, 2015.
5. Soule, T. "A Projected Based Introduction to C++", ISBN 978-1-4652-1328-0, Kendall/Hunt, 2013 (Text book).

Synergistic Activities

1. Chair of the Computer Science Department, 2018 – present.
2. Member of the IBEST Steering Committee
3. Taught multiple programming camps for middle and high school students as part of the Dig'n IT program (<http://www.uidaho.edu/cda/extension-outreach/dignit>), 2013-present

4. Taught multiple high school teacher training workshops to prepare teachers to offer dual credit computer science
5. Member of the Education and Human Resource Development steering committee and Education and Human Resource Development lead for the University of Idaho for the BEACON NSF Science and Technology Center for the study of *Evolution in Action*.
6. Member, SIGEVO Executive Board (ACM Special Interest Group for Genetic and Evolutionary Computation), 2013 to present

Current and Pending Support: [Terence Soule, University of Idaho]

Support: Current

1. Project/Proposal Title: Configurable AUV Electric and Magnetic Field Sensor Network

Source of Support: Office of Naval Research

Total Award Amount: \$1,838,547

Total Award Period Covered: 01/01/2017-12/31/2019

Location of Project: University of Idaho

Role in Project: Co-PI

Person-Months per Year Committed to the Project: 0.5 of a month, summer

2. Project/Proposal Title: Computer Science Dual Credit Expansion

Source of Support: Idaho STEM Action Center

Total Award Amount: \$25,046

Total Award Period Covered: 05/15/2019-08/30/2019

Location of Project: University of Idaho

Role in Project: Co-PI

Person-Months per Year Committed to the Project: 0.25 of a month, summer

Support: Pending

3. Project/Proposal Title: Darwin's Demons Mobile: Expanding the Market for Evolutionary Procedural Content Generation [this proposal]

Source of Support: Idaho State Board of Education

Total Award Amount: \$74,700

Total Award Period Covered (start date to end date): July, 2019 – June, 2020

Location of Project: Moscow, Idaho

Person-Months per Year Committed to the Project: Cal: 0

4. Project/Proposal Title: THE EVOLUTIONARY ARCADE: A game based context for informal learning of evolutionary biology

Source of Support: National Science Foundation

Total Award Amount: \$2,400,094

Total Award Period Covered (start date to end date): August 1, 2019 – August 1, 2024

Location of Project: University of Idaho

Person-Months per Year Committed to the Project: 1

5. Project/Proposal Title: A Transformative Online Learning Approach to Enhance GenZ Learning in Engineering Courses

Source of Support: University of Idaho

Total Award Amount: \$50,000

Total Award Period Covered (start date to end date):

Location of Project: University of Idaho

Person-Months per Year Committed to the project: 1.5