

# *Legal/Ethical/Environmental/Social Report*

## *Procedurally Generated Transitional Audio (PGTA)*

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Keefer Davies, Jordan Cristiano, Andrew Dawidek, Stephen Shi

Video games are a unique form of entertainment that require a high degree of user interaction. The nondeterministic nature of this interaction makes it difficult to synchronize gameplay with a soundtrack. Ambient audio is used in video games as a means of enhancing immersion, and having this ambient audio react to gameplay furthers this immersion. One way to achieve this level of integration between ambient audio and gameplay is to procedurally generate sound based on in-game events. Though this technique has been explored before by game developers, all of the work has been proprietary and thus not accessible to the public. **PGTA** provides an open-source solution to procedurally generate audio targeted towards integration with game engines. In addition to procedural generation of tracks using pre-recorded audio samples, PGTA also offers a means of dynamically transitioning between tracks. The PGTA engine also comes with a custom editor for PGTA projects providing an intuitive method to create tracks and transitions while requiring minimal technical skills. PGTA provides an easily accessible and user friendly approach to creating procedurally generated ambient audio.

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## 1 Intellectual Property

'Intellectual property' is a recent term used to refer to four historically distinct sets of laws: patent, copyright, trademark, and trade secrets.<sup>1</sup>

University of Waterloo Policy 73<sup>2</sup> is unique in that it allows you to retain ownership of all of the intellectual property that you create at school. Very few (if any) other schools have such a policy: usually the university claims ownership of all intellectual material created as part of university business. This policy gives you tremendous freedom and makes writing this report much simpler.

### 1.1 Copyright

Copyright is the branch of law most commonly associated with software, as software is written work. Copyright is the legal basis of all open-source software licences. You should be able to answer the following questions:

- What are the licenses attached to the software you are using?
  - SDL2 - zlib License<sup>3</sup>
  - protobuf - New BSD License<sup>4</sup>
- Are the pieces of software that you are using license compatible with each other?

Yes, all libraries used can be redistributed in source or binary form with or without modification in a commercial or non-commercial environment.<sup>5,6</sup>

- What license options are available for your project? If you are linking with GPL software then your project must be GPL, *etc.*

There are a number of open-source licenses available for our project such as, MIT, zlib, GPL, New BSD.

- What license are you choosing for your project? Why?

The MIT open-source licence is being used for PGTA. This license fits the criteria of being open-source software with minimal restrictions on usage for third-parties. The MIT license also protects against accidental damages that result from the use of the PGTA engine.<sup>7</sup> We as developers of PGTA do not want to be held responsible for any such damages.

- Does your project involve, or appear to involve, sharing or capture of third party data? Third party data should be understood broadly, including at least recorded music or movies, Google maps data, Yelp local business data, *etc.*.. What are the terms of service/usage for the data?

<sup>1</sup> Richard M. Stallman. Did You Say 'Intellectual Property'? It's a Seductive Mirage, 2012. URL <http://www.gnu.org/philosophy/not-ipr.html>. First version circa 2004

<sup>2</sup> University of Waterloo. Policy 73: Intellectual Property Rights, 2000. URL <http://secretariat.uwaterloo.ca/Policies/policy73.htm>

According to Policy 73 UW does retain ownership of final exams by classifying them as a faculty administrative task rather than as product of teaching.

<sup>3</sup> Simple DirectMedia Layer. About SDL, 2015. URL <https://www.libsdl.org>

<sup>4</sup> Google Inc. Protocol Buffers, 2015. URL <https://code.google.com/p/protobuf/>

<sup>5</sup> zlib Software. zlib License, 2004. URL [http://www.gzip.org/zlib/zlib\\_license.html](http://www.gzip.org/zlib/zlib_license.html)

<sup>6</sup> Open Source Initiative. The BSD 3-Clause License, 2015a. URL <http://opensource.org/licenses/BSD-3-Clause>

<sup>7</sup> Open Source Initiative. The MIT License (MIT), 2015b. URL <http://opensource.org/licenses/MIT>

**Not applicable**

- Who will retain ownership of the copyrights on your software after you graduate? You? Your customer? Someone else?  
The developers of the PGTA engine will retain ownership of all aspects of the software upon graduation.

*1.2 Patent*

- Is there patentable material in your project? Have you applied? Are you applying?  
The scheduling algorithm with respect to how it handles transitions between tracks is patentable. As a group there currently is no intention to obtain a patent for any aspect of the PGTA engine.
- Is the software that you are using patent encumbered in certain countries? Does this restrict the ability to redistribute your software?  
Our research was inconclusive, thus consultation with a legal expert is required for this matter.

*1.3 Trademark*

- Procedurally Generated Transitional Audio name
- PGTA acronym
- PGTA logo

*1.4 Trade Secrets***Not applicable***1.5 Export Controls*

In some countries, such as the United States, some technologies, such as cryptography, are restricted by export controls. For example, this is why OpenSSH and OpenBSD are developed in Canada. If technology used in your project is subject to export or import controls in Canada, the United States, or the United Kingdom, please discuss.

**Not applicable***1.6 End User License Agreement or Terms of Service*

If your project requires an End User License Agreement or a Terms of Service agreement, please provide and discuss it here.

The End User License Agreement is outlined in the MIT license. The PGTA engine is to be provided as is without warranty of any kind. The developers and copyright holders of PGTA are not responsible for any damages or liability arising from the use of the PGTA engine.<sup>8</sup>

<sup>8</sup> Open Source Initiative. The MIT License (MIT), 2015b. URL <http://opensource.org/licenses/MIT>

## 2 *Privacy*

- Jurisdiction: Where will your software be run? Where will its users be? Which jurisdictions should be considered?

This tool is distributed to the open-source community and thus is not bound to a specific jurisdiction.

- Canada: *Personal Information Protection and Electronic Documents Act (PIPEDA)*.

PGTA does not collect personal information and therefore cannot expose any personal information.

- USA: *Health Insurance Portability and Accountability Act (HIPAA)*

**Not applicable**

- Europe: *Data Protection Directive*

**Not applicable**

### 3 *Industry Standards, Regulations, Norms*

- PGTA provides a C application programming interface (compatible with all languages)
- PGTA is designed to work with common game engine architectures (game loop with update calls)
- PGTA makes use of streaming Pulse-code Modulation (PCM)
- PGTA uses the SI unit for time (seconds)

## 4 Ethics

### 4.1 Professional Ethics (PEO)

- Duty to clients.

PGTA does not and has no intentions of collecting any personal information from its users. All representatives of PGTA will exercise professional integrity when dealing with clients and will not engage in discrimination or favouritism.

- Duty to self.

The members of PGTA owe it to themselves to have satisfaction with the final product. The product should be complete and usable in practice. At all times members of PGTA must remain honourable, respectful, fair and honest to all related parties.

### 4.2 Philosophical Ethics

- Virtue

The core developers of this software will provide ongoing support to clients. This support will cover bug fixing, compatibility and integration issues, addressing feature requests and offering instruction to those in need. When communicating with clients, representatives of PGTA will conduct themselves professionally.

There are three main approaches to ethics in philosophy. The *virtue* approach says one should help a person in need because it exercises the virtues of charity and benevolence. The *rules* approach says one should help a person in need because it follows the golden rule: do unto others as you would have them do unto you. The *consequences* approach says one should help a person in need because it makes the world a better place. In many cases all three approaches agree. Things get interesting when the different approaches do not agree.

5 *Social*

**Not applicable**

6 *Environmental*

**Not applicable**