Let’s Have Another Gan Ainm
An experimental album of Irish traditional music and computer-generated tunes

https://soundcloud.com/oconaillfamilyandfriends

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Track listing:
1. Gan Ainm, Gan Ainm, Gan Ainm
2. The Drunken Landlady, Gan Ainm, Gan Ainm
3. Gan Ainm, Gan Ainm, Gan Ainm
4. Battle Of Aughrim, Gan Ainm, Lord Mayo
5. Gan Ainm, Gan Ainm, Tom Billy’s
6. Girls Of Banbridge, Gallowglass, Gan Ainm
7. The Blackbird, Gan Ainm, Mrs Galvin’s
8. Gan Ainm
9. Gan Ainm, Bunch of Green Rushes, Gan Ainm
10. Gan Ainm, Gan Ainm, Anthony Frowley’s
11. Gan Ainm, Toss the Feathers (II), Gan Ainm

Abstract
This technical report details the creation and public release of an album of folk music, most which comes from material generated by computer models trained on transcriptions of traditional music of Ireland and the UK. For each computer-generated tune appearing on the album, we provide below the original version and the alterations made.

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Introduction

This music album comes from a research collaboration between engineers and composers and musicians looking at how computers — specifically, statistical machine learning methods — can augment music creation. It is an experimental album in a literal sense of its 31 tunes, 20 are created from material generated by a machine-learning model trained on tens-of-thousands of transcriptions of traditional music from Ireland and the UK. We created and released the album to gauge concrete impacts of our application of machine learning with practitioners in the originating problem domain. This also gave us the opportunity to explore with experts what our models learned (e.g., how easy is it to curate good tunes in the generated material, and how generated materials can be improved); but also what they have not learned and ways in which they fail.

We hired London-based musician Daren Banarse\textsuperscript{1}, to create sets from material curated from several volumes of transcriptions generated by our computer models\textsuperscript{2}. We gave him freedom to make any changes to the material he curated. In some cases, he made only a few changes; in others, he made more substantial changes. These are detailed in the pages that follow. Banarse assembled a group of professional musicians, whom we hired to record the album at the Visconti Studio at Kingston University, UK in January 2018\textsuperscript{3}.

After the album was mastered, we printed several dozen “white-label” CDs to send to reviewers. We wanted the album reviewed as if it were a standard album of folk music, and to avoid the bias that can result when a person believes a creative product comes from a machine\textsuperscript{4}. With ethics approval granted from the Faculty Research Ethics committee of Kingston University, UK\textsuperscript{5}, we created the following story about the album, and printed it on stickers applied to the while-label CDs:

During the Summer of 2017, three generations of the Ó Conaill family gathered at the family home in Roscommon to celebrate the life and legacy of Dónal Ó Conaill. The late father and grandfather to the Ó Conaill family, Dónal was quietly dedicated to the tradition, and known for collecting local tunes without names, which he passed on to his family. His daughters, Caitlín and Úna, are joined by their children and family friends to make a recording of the best of these tunes, along with some of Dónal’s personal favourites.

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On March 19 2018, we release the album on soundcloud\textsuperscript{6} with the same information. We sent these materials to a variety of reviewers in Europe and the USA.

On September 7, 2018, we revealed the true story to all those who had reviewed the album, or commented on the album via Caitlin’s email\textsuperscript{7}. Our message to these reviewers was the following:

Thank you for listening to “Let’s have another Gan Ainm” (https://soundcloud.com/oconaillfamilyandfriends). We are especially pleased by all the praise expressed so far. That is a testament to the fine musicians appearing on this album, and the hard work they put into bringing it about. After all is said and done, we are all very proud of it.


\textsuperscript{2}This album is a deliverable of the project Sturm and Ben-Tal, “Engaging three user communities with applications and outcomes of computational music creativity” (funded by UK Arts and Humanities Research Council, grant no. AH/R004706/1), https://gtr.ukri.org/projects?ref=AH%2FR004706%2F1.

\textsuperscript{3}Our source code and training data are here: https://github.com/IraKorshunova/folk-rnn

\textsuperscript{4}This album is an example of our past experience with such bias, see the following: https://highnoongmt.wordpress.com/2017/05/29/an-accidental-listening-experiment/

\textsuperscript{5}Approved document here: https://tinyurl.com/yb7sq58u

\textsuperscript{6}Sturm communicated as Caitlín during this time.

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\textsuperscript{6}The musicians on the album are: Tad Sargent (bouzouki), Bryony Lemon (accordion), Grace Lemon (pipes), Daren Banarse (melodica), Eimear McGeown (flute/whistle), Rob Webb (fiddle).

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\textsuperscript{8}For an example of our past experience with such bias, see the following: https://highnoongmt.wordpress.com/2017/05/29/an-accidental-listening-experiment/

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\textsuperscript{10}Sturm communicated as Caitlín during this time.
AN EXPERIMENTAL ALBUM

In fact, “Let’s have another Gan Ainm” is an experimental album in a very literal sense: of its 31 tunes, more than half are generated by a computer that has analysed thousands of transcriptions of folk dance tunes from Ireland and the UK. This album is a culmination of a research collaboration between engineers, composers and musicians looking at how computers can aid in music creation. Working together, we arrived to the idea of this album to address several questions:

- How effective are these computer-generated tunes within the kind of folk music this computer is trained on?
- How hard will it be to create an album from all of this material?
- How hard will professional folk musicians find the process of learning the computer-generated tunes and recording the album?
- How will expert listeners respond to the tunes?
- What will the public think about the album?

WHO ARE THE Ó CONAILL FAMILY?

There is evidence a human’s judgement can be biased when they believe that a creative product comes from a machine. To avoid that, we created a backstory to accompany the album, and a gmail account for soliciting reviews. There is no Ó Conail family, and we apologise for having to use this ruse. We hope you understand the need for it. (We sought and received ethics approval from the Faculty Research Ethics committee of Kingston University, UK: https://tinyurl.com/yb7sq58u)

WHO ARE WE?

Bob L. Sturm (http://www.eecs.qmul.ac.uk/~sturm) is the principal engineer on the project. He has been an enthusiast of Irish traditional music since living in Limerick, Ireland during the summer of 2000. His day job (now Associate Professor of Computer Science in the Speech, Music and Hearing research division of the KTH Royal Institute of Technology in Stockholm) is focused on making computers work “intelligently” with sound and music data. (He also plays in sessions in Stockholm, and runs a Learners’ Session there.)

Oded Ben-Tal (http://obental.wixsite.com/main) is the composer on the project, and is interested in the potential of computers to augment creativity. In fact, he used this same system to compose a piece melding aspects of the style the system learned with his own compositional ideas (https://tinyurl.com/yapo7g7q). Ben-Tal teaches composition and music technology at Kingston University in London.

WHAT HAVE WE DISCOVERED SO FAR?

Our computer program has learned enough about real tunes that it can generate new ones that are not too bad. At the same time, we clearly see that the program knows very little about music. The latter cannot be overstated: our computer program does not know the rich history and diverse functions of this kind of music, or even the major contribution trained musicians bring to playing folk music. It is merely creating sequences of symbols that talented humans can bring to life (as our album illustrates). In spite of its clear limitations, we have found that our computer program can be a useful partner in some aspects of human musical creativity. Some amateur musicians are using this system as a pathway to becoming more creative within the tradition they know and love. For instance, when Ben-Tal showed this system to his students they immediately saw the potential. They enthusiastically produced tunes and used the parts they liked in their own music making.

WHAT DOES OUR WORK NOT SHOW?

When we discuss our work in articles, concerts, and talks, we emphasize several important points. Our work does not show, “Irish traditional music is so simple a computer can do it.” Our computer program is merely a “parlor trick” having statistical machinery that is sophisticated enough that it can create some sequences from which human experts can make nice music. Our work also does not show, “There is no need for human composers.” Music is and always will be a human activity no matter how “good” computers can be made to mimic us. Composing and learning music cannot be substituted by pressing buttons.

12 Which you can explore here: https://folkrnn.org
13 See some examples here: https://tinyurl.com/ybqz2bey https://tinyurl.com/y6u7cznj
14 Like this one, https://youtu.be/JZJBZvyHlyA
WHAT TO DO NOW?

Our research has greatly benefited by interacting with a variety of people and viewpoints, positive, neutral and negative. Recording and releasing this album is an effort to more widely engage non-academic audiences with our research. The album is and will remain publicly available for free (downloadable from soundcloud). We want to hear any of your thoughts about the above now that you know more about the project. Considering the above, how does one’s perspective about the music on the album change, if at all? If you would like to have your comments anonymized in our records (or deleted completely), please let us know by September 14, 2018. In any case, we will not reproduce anything you have said about the album without your permission to do so.

On September 24, 2018, we made this technical report public and distributed a press release about the album.

The actual track listing of the album is as follows:

1. #21003 (v2), #2375 (v2), The Glas Herry Comment (v1)
2. The Drunken Landlady, #11929 (v2), #10875 (v2)
3. #21294 (v2)/#18253 (v2), #21064 (v2), #6582 (v3)
4. Battle Of Aughrim, #21041 (v2), Lord Mayo
5. #11593 (v2), #11906 (v2), Tom Billy’s
6. Girls Of Banbridge, Gallowsglass, #945 (v2)
7. The Blackbird, #21133 (v2), Mrs Galvin’s
8. #2897 (v2)
9. #21184 (v2), Bunch of Green Rushes, #21112 (v2)
10. #29747 (v2), #1121 (v2), Anthony Prowley’s
11. #21013 (v2), Toss the Feathers (II), #1068 (v2)

Traditional tunes are in italics. Numbers refer to specific generations by a folk-rnn model (with the model version in parentheses). The v1 model also titles its transcriptions.

In the following pages, we show how each Gan Ainm on the album comes from material generated by folk-rnn models. Each tune appears notated, first in its “original” form and then as edited by Banarsë (with notes colored red to show differences). Some of the changes are very minor, and others are more extensive. When recording the album, the musicians were free to interpret the tunes as they saw fit.

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16“Gan Ainm” is Gaelic for “without a name”.

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Track 1: Gan Ainm 1

#21003, folk-rnn (v2)

Daren Banarsi edit.
Only bars 1-16 of the generated transcription are used. Another performance of this tune can be heard as the third in this set [https://youtu.be/lZKc363886Y](https://youtu.be/lZKc363886Y).
Track 2: Gan Ainm 2

#10875, folk-rnn (v2)

Daren Banarsi edit.
In this case, Banarsë combined ideas from two different generated transcriptions. The A part comes from the A part of #21294, and the B part comes from #18253.
Track 3: Gan Aим 2

#21064, folk-rnn (v2)

Daren Banarsi edit.
Track 3: Gan Ainm 3

#6582, folk-rnn (v3)

Daren Banarsë edit.
Banarsé doubled the durations of the notes in the generated transcription and made the meter 4/4.
Track 5: Gan Ainm 1

Daren Banarsë edit.

Banarsë swapped the parts of the generated transcription to create this tune.
Track 5: Gan Ainm 2

Daren Banarsi edit.
Track 6: Gan Ainm 1

#945, folk-rnn (v2)

Daren Banarsë edit.
Track 8: Gan Ainm 1

A completely different performance of this tune can be heard as the second in this set
https://youtu.be/_qpHaSwiJ-o
Track 9: Gan Ainm 1

#21184, folk-rnn (v2)

Daren Banarsë edit.
Banarsë swapped the A and B parts of the generated transcription to create this tune.
Track 11: Gan Ainm 2

Another performance of this tune can be heard as the second in this set

https://youtu.be/j7RpmmahiZQ