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Mostowski

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A FOUNDATIONALIST LOOKS AT THE PIANO

I think of myself as a foundationalist.

But what on earth is a foundationalist? Someone who specializes in the basements of homes, to make sure that they stay dry?

Or is it an expert in charitable foundations, and how they decide which projects will be awarded money?

None of the above.

A foundationalist focuses on the foundations of subjects. A foundationalist looks for the most fundamental concepts relevant to subjects, with the intention of rebuilding subjects from the ground up starting with the most fundamental relevant concepts.

Historically, the biggest success of foundationalists has been the development of the foundations of mathematics. Tomorrow will focus on many interesting topics in the foundations of mathematics, with many speakers.

A FOUNDATIONALIST LOOKS AT THE PIANO

But now I want to focus on the piano.

I took piano lessons regularly for about 9 years before going away to college at MIT. I practiced little and didn't have much natural talent for the physical side of piano playing. I also had the disadvantage of having small hands.

Consequently, I was not regarded as any kind of piano talent. My last piano teacher did not encourage me to study music in college.

In contrast, I found mathematics far easier, and was particularly attracted to the mathematical philosophy of Bertrand Russell.

I left home for MIT in 1964, and I received my Ph.D. in mathematics in 1967, with a Ph.D. thesis in mathematical logic.

But back to the piano.

I didn't practice or play much piano from 1964 to 1977. I had only a modest console piano (Knabe) in my home.

A FOUNDATIONALIST LOOKS AT THE PIANO

In 1977, I arrived as Professor of Mathematics at Ohio State University. Soon later, I acquired a 9 foot Bösendorfer concert grand piano at an enormous discount. It had been damaged in a major snowstorm. It needed new keys, and suffered deep scratches, and there was lots of broken glass on the sound board.

I hired the piano technician for the Columbus Symphony to take a look at the piano, and he said that the damage was completely superficial, and recommended that I immediately purchase it at the offering price.

So I did.

But how do you play such a piano?

My Foundational side started to take over. What is the pianist doing to create such spectacular effects, such emotional nuances, fundamentally?

In the meantime, I started to practice a few hours a week.

A FOUNDATIONALIST LOOKS AT THE PIANO

In the 1980's, I made modest progress in the piano with my modest practicing, and was deeply mystified by just how the professionals do what they do. My assumption was always that they had some special and very natural kind of physical dexterity, (usually) large hands, and uncanny memory. I pretty much decided that I would never be able to sound like the professionals.

Yet, in some selected, very simple, but beautiful passages, where dexterity, large hands, and memory are not relevant, I did think that I sounded near professional.

This encouraged me to try to get to the bottom of professional piano playing. What was I doing in those simple passages?

At the most fundamental physical level, the pianist is doing surprisingly little. But these very limited things are happening all at once, and they are carefully proportioned. And these few proportioned things, in combination, have such enormous power.

So what are these few elements?

THE MOST FUNDAMENTAL DATUM

The most fundamental datum is by no means comprehensive, but is, rather surprisingly, sufficient to create satisfying and striking performances of at least a significant portion of the classical piano literature.

Each datum has three parts.

- 1. The time in milliseconds from the start of the performance. The time stamp.**
- 2. The name of the note. One of 88.**
- 3. The intensity of the note. One of 127 levels of intensity.**

127 is the loudest, which is extremely loud (roughly ffff), down to 1, which is extremely soft (roughly pppp).

Intensity 0 is reserved for the release of the note.

In these terms, a performance is simply a finite list of such events, in increasing order of the time stamp, with a special final datum containing only a time stamp, indicating the end of the performance.

NO KEY MASSAGE? NO PEDAL?

It is rather striking just what is missing from this fundamental datum.

Most people and even most professional pianists think that the striking or massaging of a piano key profoundly affects the sound, and cannot be reduced to a single number from 1 through 127.

But scientific common sense (sometimes in short supply) and scientific experiments demonstrate that the conventional wisdom is wrong.

Moreover, one millisecond timing and 127 degrees of intensity is far more than what is under the professional's control.

But no pedal? For many pieces, playing without pedal is not an option.

This data format actually supports the connecting of arbitrary numbers of notes in any way. This is something totally unapproachable by any pianists with their only 10, and not 88, fingers.

MIDI PIANOS

MIDI = MUSICAL INSTRUMENT DIGITAL INTERFACE

The performance files we have been talking about are a small fragment of what are called MIDI files. Further, they are played back exactly as intended by today's MIDI pianos.

For listening to a MIDI file, the keyboard is completely irrelevant. Even the creation of a MIDI file can be done without a keyboard, but you still need an input device such as a computer. A keyboard is a major facilitator.

The MIDI file can be created by playing normally on an electronically equipped keyboard (MIDI keyboard). But most importantly, there is no need to play the electronic keyboard well - or even play the electronic keyboard in real time.

Instead, you can use the MIDI keyboard for anything from pure note entry all the way up to polished performance.

This is because you can use powerful computer editing software.

I created a 20 minute recording in this way, which completely fooled some major piano professionals. It's on my website.

BRAIN TO DISC

I used a top of the line Clavinova (electronic piano), either for pure data entry, or to enter rather sloppy and unsatisfactory performances of the various pieces. I did not use pedal.

I then used a powerful graphic editor to display the data, play back the data, and edit the data.

Here is the process that I followed, stated in simplified form.

I played back the file until what I heard differs from the performance in my brain. I then did a single or sometimes a few edits to make the file match the brain performance. Then played back from the beginning to again find the first place at which the file differs from my brain performance. I repeated this process until the playback of the file matched my brain performance perfectly.

This can take several hours for a minute of music of moderate complexity, involving several hundreds of precise edits.

WHAT HAPPENED NEXT? MAJOR SURPRISE

I made a CD of the 20 minute performance and distributed it to many people in 2009. I later put it on my website so anyone can listen to it.

But what happened was quite surprising.

I had “decided” to discontinue substantial piano practicing and playing, since I can create professional quality CDs in this way. Furthermore, the technology was steadily improving, with more advanced systems available, with better sound, and additional useable features.

But there was still a point to starting the editing process with more reasonable performances. This saves a lot of time and effort.

So I was still motivated to do some practicing on my real piano.

To my surprise, there was very major pianistic improvements in all dimensions with very little effort.

WHY?

My theory is that the extremely intense experience of creating brain performances away from any physical distractions, and working with them every day for months, had a way of putting the physical side of piano playing at the service of my musical thought processes.

This is only the beginnings of an attempted explanation.

In any case, this startling improvement in piano playing without little work has continued nonstop, and noticeably every day, since 2009.

Where this is leading is totally unclear to me at this point. I made the decision to try to get some exposure for this by playing for people.

One thing I am certain of. Whatever you hear today and tomorrow should be better soon thereafter!

WHAT NOW?

I may be on a path toward creating a distinctive style of live classical piano playing. However, I am going to proceed cautiously since I am 99% self taught and have had limited contact with piano professionals.

From some feedback and general observations, it seems likely that the classical piano community is not grappling with main issues.

This is the same observation I made for decades about the math logic community - and other communities I am familiar with.

In current piano playing, because of lack of career opportunities and the contest system, there seems to be strong discouragement of controversial playing. Contests are said to be won by playing that offends the least number of jurors. This spills over to the educational system, where a kind of “normality” is forced on the students.

There is also a related preoccupation with playing in a way that is believed to be according to the composer’s intentions. But there is considerable evidence that many great composer/pianists played the same music quite differently on different occasions - even considerably varying the notes.

TIMING

One particular casualty seems to be the use of major timing variations. Such variations are particularly offensive to many professionals.

It is often said that in the 19th century, major timing variations were a very integral part of the top performances. But now, it appears that few if any of the top performers are using major timing variations in their playing.

So it is here that I see a major opportunity for doing something important.

Bring back subtle and deep timing variations to classical piano performance, and even push the envelope further in imaginative ways than ever before.

I started off being only concerned with the nonexistent science of classical piano performance subtleties. Right now, I am having too much fun with live performance. But ultimately I hope to return to the scientific issues.