Origins of live coding

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Live coding

<INSERT DEFINITION HERE>
Live coding

- Art of re-programming; changing your mind about a process once established
- For artistic purposes, often live performance; possible aspects of theatre, meta-composition
- Venues including studios, concert halls, planetariums…
- Used to be a bit controversial, now institutionalised?
Other terms...

- Live programming
- Interactive programming
- On-the-fly programming
- Performative programming
- ascii music...
Or...

- Live coding is the realtime collection and coding of interview data, e.g. in qualitative medical research?
Ancient live coding history

- Greek debates?
- Ancient algorithmic composition: Guido d’Arezzo c. 1026
- Fior vs Tartaglia, 1535
Precedents: improvisation

- Music’s natural state?
- Generativity of language itself
A literary precedent

- Hermann Hesse *The Glass Bead Game* (1943)

- ‘the players, mutually elaborating these processes, threw these abstract formulas at one another, displaying the sequences and possibilities of their science.’ (pp. 23-4, Vintage: London 2000 translated by Richard and Clara Winston.)
Text pieces

- Primarily 1960s
- ‘verbal notations’ (Lely and Saunders 2012) ‘word events’ George Brecht
- An example of maximal freedom: LaMonte Young Composition 1960 #3 ‘Announce to the audience when the piece will begin and end if there is a limit on duration. It may be of any duration. Then announce that everyone may do whatever he wishes for the duration of the composition.’
Text pieces 2: live coding?

- Are there any early self-rewriting text scores?

- *Schooltime Special* Cornelius Cardew 1968 contains possibility to extend itself via new questions

- Click Nilson’s precedents (1975, 2012)

- Honourable mention though a late arrival: [https://twitter.com/textscoreaday](https://twitter.com/textscoreaday) 11 Dec 2012 “#60: Take an existing text score and profoundly alter its meaning by changing only one word.”
Games

- Nomic, 1982, Peter Suber
- Fluxx, Calvinball etc…
Computer science precedents

- LISP, c. 1962 implementation as first interpreted programming language
- Use in education via LOGO from 1968 to control virtual turtles
- Smalltalk 1980, FORTH

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Live coding history: 1980s

- 1980s Forth and HMSL. Computer musicians’ frantic preparations up to performance time (the audience wander around The Hub)

2000, slub start to play in London projecting their screens

Julian Rohrhuber exploits SuperCollider 2 to allow hot-swapping code in performance
The Tspawn trick (SuperCollider 2)

//run me first
({
    a = Tspawn.ar({arg ts,ec,syn, func; func.value},2,inf, 0.0);
    b = a.source;
    a
}.play;)

//now
b.trigger({Pan2.ar(SinOsc.ar(exprand(220,440),0,0.1), 1.0.rand2)})
(Selected) Chronology 1

- 2000: ICMC Berlin, networked code passing McCartney/Rohrhuber
- 2002: First live coding albums (unreleased)
- 2003: ChucK
- 2004: TOPLAP
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TOPLAP

- Multiple interpretations
- Scene: Feb 15\textsuperscript{th}, 2004, 2am, a smoky bar, Hamburg. An anagram competition
- Livecode mailing list now has 100s of enthusiasts
(Selected) Chronology 2

- 2005 TOPLAP transmediale
- 2005: first live code battle
- 2005: fluxus
- 2006: aa cell practice
- 2007: LOSS live code festival
Fights

- The boxing analogy rears for the World Programming Federation Fingerweight Belt
- Ghent 2005: Coding Bull: McLean vs Collins (match rigging allegations)
- Barcelona 2005: Raging Code: Wang vs Collins (disaster!)
Challenges continue

- Nic vs Nick (2-1, New York/London/Mexico City) and The Ultimate Weapon
- Max/MSP in Belgium
- Mexican live coding
Practice

- The importance of ten years
- Practice pacts
- No guarantee of effective transference (e.g. ordinary coding to live coding)
- Danger of misplaced practice with new techniques
Selected Chronology (3)

- 2009: BBC documentary on pub code
- 2012: Live Notation AHRC: live arts and live coding
- 2013: Live Coding festival in Karlsruhe
- 1::year => now
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Documentations

- 2007 A pre-history of live coding
- 2012 CMJ DVD
- 2014 Computer Music Journal special issue
Continuing live coding developments

- Live coding without computers, including choreography
- Live coding orchestras and ensembles
- New live coding environments, especially browser and mobile based
- Live coding in computer science education and HCI
Live coding collaborations

- Live coding solo is very stressful
- Experimentalism is easier with a community support group
- But you may need more data projectors
A historical example: Wrongheaded (2009-2013)
Wrongheaded
(with Matthew Yee-King)

- Algorithmic choreography
- Laptopists caught between programming work and external human action
- Our lowest moment: Leonardo 44(3) cover stars

for while if else switch break goto continue default char signed unsigned int short long float double enum union

% * + - / \ ( ) [] ; ? : , | | && ! & > < >> << . f

0 1 2 3 4 5 6 7 8 9

a b c d e f g h i j k l m n o p q r s t u v w x y z

true Hello World false

Ouija code

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Chalk explode

April 1, 2014

Zombie mode
Warning!

- Look away if you’re squeamish before the next slide
An anatomy theatre
The Gospel According to Wrongheaded
iPhone live coding
Marc J. Rubin (2012)  
The Effectiveness of Live-Coding to Teach Introductory Programming.  
SIGCSE’13, March 6–9, 2012, Denver, Colorado
Consequences
Conclusions

- Rewriting the rule book of rule-based art?
- So whatever I said, change it
Think you for lastening