

8-16-66

Art. Int.; what has been done, what needs be done.

Introdn: Progress to ~ ~~to~~ Mid 1960 (~ Minsky paper ~~covered~~)
state as of then. Give general statement of nature
~~of~~ ~~the~~ ~~problem~~ of A.I. goal — list very
~~large~~ large no. of approaches used. 1956-1960

~~After~~ After 1960 — concentrate on self improving
machine.

1956-1960 first list approaches ⁽¹⁹⁶¹⁾ Marr talks about
then list additional approaches.

At 1960 ~~list~~ tell about self imp. system: ~~to~~
tell what impt. work ~~up to~~ 1956-1960
They tell work 1960-1966. First ~~list~~ list
main areas of impt. work relevant to this goal.
Tell how far various people have gone, ~~and~~ ~~what~~
what needs be done ~~on each~~ on each
project ("criticize" only w.r.t. "what
needs be done.")

What needs be done in general.

for my own use, for "Bookmark"
in "Plans", list various A.I. approaches
that I think are good, telling what
has been done & what needs be done.

General: For IE3: Write good introduction, explaining what my approach is & why (i.e. self-improving machine).

More than just param adjustment. (Samuel). ~~simple combn~~

Samuel (1965) & U; V (1963) have done a little, but vocab. of combn. is too small. Must be able to find all ~~old~~ old heurs

& any desirable new ones. New. Ernst have listed a few types of heurs. More of this ^{type of} work needs to be done

— also devising method to learn them.

Approaches to A.I.

- 1) Heuristic Prog: ~~Use~~ Use Human methods as guide.
- 2) ~~Try~~ Try mainly to understand human intell.
- 3) " for any kind of intell. behavior.

- 2) Neural nets: ^{A few} clues from neurophysy, social nets.
 - a) try to simulate bio. nets.) ^{very few clues, hvr.}
 - b) " for anything.) ^{Lashley results}
^{Leatvin result.}

- 3) ~~Evolution~~ Org. evolution: ~~simulation~~ using ideas from org. evolu. ^{Prob. Soln.}
- No attempts at simulation, few heurs used.

- 4) History of Sci: Use of historical data — usually on "Great Scientists" to find heurs to explain how they could have made various "discoveries".

Oct 9, 66

Important things to check before final revision - since ~~the~~ ^{pre. comments}

- 1) Are ~~all~~ of all's instructions "complete"? ^{that might} ^{be changed.}
- 2) Just what is Hornum's ~~method~~ ^{learning} method? (see Warr's comments)
- 3) Just what is Uhr's MT learning method?

Aug 18, 66

Revision of t. Aug 15, 66 paper!

Read IFIP'65
More Carefully.

- 1) Read to folp. in more detail
 - a) NSS 60 (SOS) $\left\{ \begin{array}{l} \text{Also Epou: Is } \exists \text{ } \text{GFS} \text{ necy. for t. diff. improvement} \\ \text{method of SOS 60? Is t. complexity (w. Epou) of t. Munich} \\ \text{62 method of diff. improvement necy?} \end{array} \right.$
 - b) Amarel (Some papers) $\left\{ \begin{array}{l} \text{NSS's idea of "learning" by "looking" figuring things} \\ \text{out, rather than by "statistical studies".} \end{array} \right.$
 - c) Horvath: More detail on prob. or. machsm., induction; how does her
soc. learning actually work?
 - d) Evans: details on induction \rightarrow show just how it may be applied
to other \sim probs
 - e) Kilborn - is lang. univ.? just what was Reiv search schem.
 - f) Abrahams. Be sure that our characten of t. method is
correct (no new reps. created, no obss).
 - h) Fogel - contrast w Friedberg; Read his book more - would
K-R do a compsu. really be likely to create chromosomes? ~~to~~
 - i) Faulk: Just what movement. "Similarity" funct. would use?
How could his H.C. method be more "intelligently
directed" i.e. how could ^{nature of} diff. from perfect fit help
guide corrections.
 - j) Narasimhan: Exactly how did he do practical induction?
Did he really use a PSG model, or is he all confused.
 - k) Read some recent Edeu. Can his method be
formulated as a grammar - or a more generalized PSG?
 - l) Uhr, Vossl.

2) Tell in detail, what could come of each work - what
areas need much development - which are the hardest.

3) Expand certain imp. tech pts. ~~to~~ ~~the~~ ~~same~~

- a) Completeness (days b) Give examples of utility
of chromosomes also case of non-utility.
Give examples of complete
days: Also a complete
2 dim. lang.
- c) Give much more detail
on Solomonoff - e.g. 2TB143,
I & II - how it tells
how much \rightarrow prop to assoc. w. complex machines,
or complex defns.

Nov, 66
Info Needed:

- 1) Ref #19 : AFWomb \Rightarrow ^{nr. Lincoln} Atnscom. AFB. (where in Mass?)
- 2) Present Contract no. for Airforce.
- 3) Look up De bawm, E is not ref.

256
Mary

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9.0: 3:36

Note on ~~the~~ IE³ rev.: Tech notes, changes, what needs to be done: Page numbers are 1 - 49.

1. Later mention "adequately" means Bootstrapping possibly
2. Playing a good game of chess is better (logically)
3. Some tasks common in a.i. are (not so sure this is an improvement)
 2. "initial desc. is xform into" → change so it's clear that better descns would help solve — i.e. that desc. in it self isn't such a big prob.
 3. Mention something like "adequately improve," & explain
 - 3. "but" ~~isn't~~ may not be legible.
 3. "self-improvement" → ~ add of f. sort naccy for bootstrapping.
 3. Perhaps somehow get in more emph. of quality of Marr's paper.
 4. "centralness" — is this a good example?
 5. ~~top~~ would use → used. "interesting kind of internal colon" ? too vague.
 6. H.C. refs are poor: Ask Marr. for better?
 6. Ref to Ernst 1966 is poor — ~~add~~ ^{re-} personal comm. w. Newall in bibliog.
 7. T. modification of GPS so that it ~~will~~ ^{what was objection?} (23)
 8. It should be pointed out, what corresp. to what (H.C. → Newall's scheme).
 8. ~~on~~ a computer within GPS.
 9. Perhaps ~~can~~ ^{select} point out + relevance of ~~the~~ ^{the} Ashby's principal more, ~~clearly~~
 9. ~~Another~~ impt ~~of~~ (11) ~~is~~ ^{is} ~~to~~ ^{to} ~~not~~ ^{not} confuse.
 9. "construct a table rapidly" (2nd last l).

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10. top line ("not neg. chance" - it will not extrapolate unless random or ~~com~~ systematic (pointless) entries are perturbed. table.)
10. any of hq's "systems" (25).
10. "Admin Routine" (2 last ^{minus} 27)
- 11: 24 s.g. or a plan (first mention! (parsing ambiguity))
- 11: trial "copy vacopa ..." (2-6) unclear (parsing?)
- 13: (21) : "still ~~empt~~" (make ~~clear~~ why - say more)
- 14: (25) : useful \rightarrow vacy (?).
- 15: (23) point out that this is a big diff betw. G curves & Stop's method.
- Middl: Indicates that "t. prob that looks n" is t. task not prob, not t. main prob.!
- Also Differentiate betw. "Merit" & "self merit" I think I do.
- 16: Perhaps use Marv's Sci Amer article as a ref. or ~~is~~ as a review ref.
- 17: top Human prob solving - perhaps put this whole discussion later pp 29-30, fl. Also add Greenberg ref. ~~with~~ don't underline.
- 19: (2-6) ~~Another~~ Another very diff (ambig (parsing?)),
- 19: last many of our deficiencies of our understanding of semantics

20 (2-9) emp. data for it?

21 last, ff : Evoln. of Solomonoff - is this a good way to state this or is it a good evaln.?
- What are v. actual diffys w. these theorys?

fast ↓

25 \$"best" 100 idea may not be clearly explained.
26 - use better ref. than Stebbins, 1966
29 mention tie-in w. / research on genet evoln.

Bottom [P - place somewhere else!]

~~31 -> it could use -> more readability, use~~

~~40 - mention IT Good paper on Turmac (No!)~~

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Criticism of F. Review

- 5) My discn. of Foulkes' work isn't v.g.
- 6) on Simulation of Evolution, Barricelli (92) I never saw this paper
~~it~~ may be v.g. is much Past Fogel.
- 7) ~~Newell's~~ ^{good} Newell's using his "good set of criteria" for a "set of diffs" is realistic, it may end up pushing F. true Gore down hill!
look into this!
- 8) I should find out if Y. Kilborn set of restrictions is "complete".
- 9) Narsimhan ~~is~~ - I should read his papers more cavalily - I'm not sure just what he does have!
- 10) Hormann may ~~use~~ use (w. some success) in her induction unit, i.e. kind of "sharp-edged hypoths." that I found so ~~poor~~ "useless" in Kochen's ~~work~~ (i.e. Hunt's) work.
- 11) Perhaps acknowledge criticism ~~our~~ ^{to some extent to} debt to Minsky ~~via~~ ^{via} 2 ~~other~~ ^{anonymous} reviewers.
- 12) John Holland on Evolu. JACM (first art. in issue) ~ 1961 or earlier. I may have reprint or preprint or both!
- 13) Barricelli, N., "Numerical testing of evolutionary Procedures." Acta Biotheoretica 1 : 2 (1963)
- 14)

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Serious Criticisms of t. review:

1) ~~On Slog:~~ On Slog: I mention diffracs betw. the probs. dealt w. in this 1964 & 1965 papers. Just what are these diffs. & are they important? I think it had to do with closing a task, then working on it a while, then having new info that might lead one to decide to work on some other task. Slog 64 didn't deal w. this prob., but ^{maybe} could ^{my} G(E) approach can and does. This difference may account for the fact that Slog. didn't think his '64 paper was relevant to his '65 problem.

2) Re. Horvath: I really have mixed up idea of her system, & this ^{fact} is reflected in t. review.

3) Uhr & Voss: T. conclusion that their success w. speech recogn. reflects only that local template matching is useful in recognizing speech from ~~sp~~ sound spectrograms is false. The ~~more~~ new "combination operators" they used may have been useful. but one doesn't know.

4) Uhr: I could get much more out of his "pattern string" paper. Also one of the "Memos" he sent me has a lot of detail on it - so I could make much stronger statements on his system.

Aug 18, 66

Some new papers to read (possibly)

~~It~~
~~isn't~~

- 1) Jaynes principals ~~may~~ be equiv. to com! - read original work by him.
- 2) Uhr. Voss. - their system in more detail - in particular, their ~~to~~ MT system.
- 3) Read some other works on "Evolution Simulation"
- 4) Banerji.
- 5) Coy in ~~New Mexico~~ Albuquerque. 1965 ATP WJCC. (Gene Bussey)
- 6) Go thro Journals somewhat systematically.

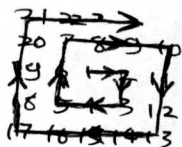
8.29.66 :



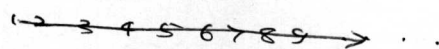
Ph. disco. w. Papert: Marr. & he have discussed a 2 dim. Turmac. in their Perception paper (1966: New York).

⊗ Turmac w. semi-co tape is no trouble: fold it & interleave it.

from 1. semi-infinite tape I can make a 2 dim. Turmac by spiraling 1. tape around 1. origin:



corresps. to



How 1. 2. D turmac knows when it gets to 1. corners, isn't clear. It would have to store info about this as it spirals around.

Seymour has gotten a grad. stud. to work on 2 dim. rewrite rules, but she didn't get anything.

In general Marr. & Seymour are int. in 2 dim. langs.

S. seems to be thinking in terms of certain formal apparatuses controlling (sequentially), 1. use of others ("öbs" controlling "öps").

S. suggd. trying to figure out better ways than U&V. for combining their "characters" — I'm not sure this is so easy. It depends on just what kinds of things one is looking at.

Comments, opinions:

W. Bladsoe: 1) Widrow (Adaline) is very poor

2) Vogel is not v.p., but B. hasn't read V recently so is not too sure.
B. has done work on ~~E~~ Evolutionary T.M.'s.

~~3)~~

Bladsoe, Minsky: E. Feigenbaum's EPAM is very simple - is not much of a step toward A.I.

Minsky: That NSS are wrong to concentrate on ~~Alman~~ trying to understand Humrus - that they have made little progress since their ^{great} idea of GPS. ;

That Vogel is N.G. - has no substructure learning.

1) Mc's students ~~so~~ - many ^{reports} ~~paper~~ (SRI)

showing how various AI probs map into probs in 1st order pred calc.

Doc of this in (SOS'60)

2) NSS: 3 yrs. on "DPL" = (?) ditto ppg. log. they met. trouble due to lack of "power" of lang. - latter decided it was unpt. That machine must "know a lot" before working hard probs.

Lots of good ppgs. used on this DPL. In one paper, they gave a v.g. criterion for E. Gore of a "set of differences" OEO (Legal) Austin, Texas

3) ~~MANNA~~ New 62b (SOS 62) "basic organza" has a doc. of what New had t. fifty's in DPL were. Mov. that there were some good ideas in 8. paper hvr.

4) "Matching" has to do w. determining if one expression is a subn. instance of another. Various very fast ways have been devised to do this. I don't quite understand just what this is - unless "substitution instance" means "w.o. reduction (= "simplification"). If reduction is allowed, it sounds like a diff. prob.

5) A student (Musk's or Mc's?) has devised a symbolic integration ppg much ~~to~~ more capable than Sagle's that does \approx (almost all?) S's in a table of S's.

~~into~~ Joe Moses

is expected to when hours are added. But not yet 8-8-66

30 July 10, 66

83° 53% ←
20% Throd.

Discn. w. Marr:

1) Uhr and U. have rather limited lang. - this is cut down when they decide to use⁹ moments.

→ 2) Probistic Formacs in "Automata Studies Secus" relevant to ~~my~~ my recent work and possi: "proof" of my basic thm.

3) Bloom has stopped; ~~Marrill~~ hasn't done much to continue on Cyc II
Mike Larin.
Soford Saris

4) Marr. did do a little expansion of his picture lang. "into wallpaper" act. in his original manuscript.

5)