THE EIGHTH WHITE HOUSE PAPERS G raduate R esearch in the C ognitive and C omputing Sciences at Sussex

editors

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Preface

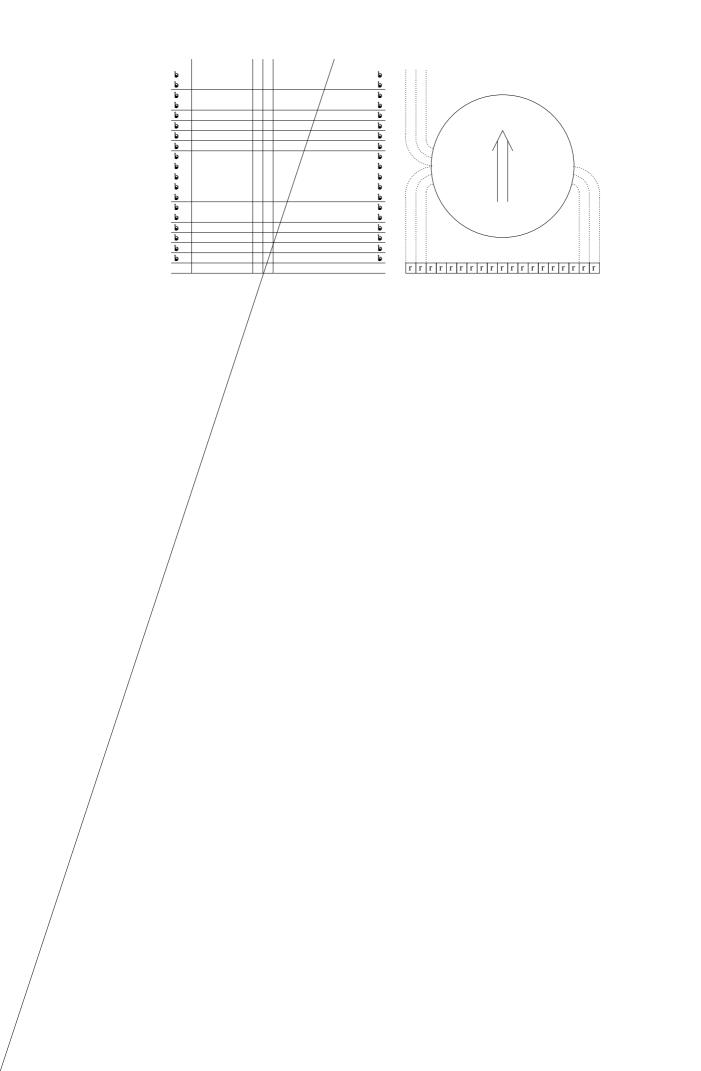
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From Genotype to Neural Network through Hierarchical Organisation

Guillaume Barreau guillaum@cogssusx.ac.uk

School of Cognitive & Computing Sciences University of Sussex Brighton BN1 9QH

Abstract nt_now Art_n_a r as pa_v r -tt- att nt_on to t prob- s or v - op nta-bie o Art r -st_n so or t r asons with s prob- s in the work

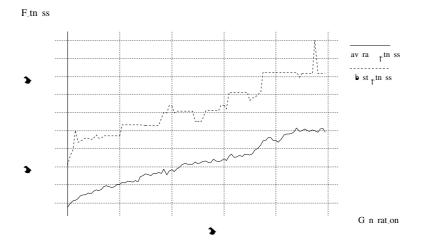


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References

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References

Automatic Debugging of Multiple-Function Programs

Changiz Delara changiz@cogs.susx.ac.uk

School of Cognitive & Computing Sciences University of Sussex Brighton BN1 9QH

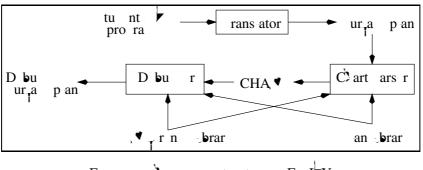
Abstract 3 s pap r r ports on an int - nt bu in s st bas on t^2 p an a us or a s $\sqrt{2}$ at rs or auto at a t tin an orr tin s ant rrors in nove stu nt pro rais writtin in t^2 Its o put r p ntation is a E t^2 p and t^2 ov ranstructur of t^2 s st an is an overve wort a opt t 3 n.qu for bu in sin - un tion pro rais a so is uss t^2 approa t at us to bu pro rais with u tip- functions Final futur r s ar 3 wor is point out

1 Introduction

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2 The Overall Structure of EMILY

E IFY onsists of ter ou san two now-bass is ar te transation ou trans ator, te pro ra un rstan in ou te is art pars r, te but t tion ou bu r, te pan brar, an ter r n brar F ur sows te ov ra-strutur of test is transation ou is r sponsible for transatin a stunt is pro ra into its quiva int sur_ra pan r pr s nta tion



F ur $r \to ov ra-stru tur o_r E I Y$

b pro ra un rstan n o u a pts tè sur a p an o

or \dot{c} wron un ton s a b sta w assu \dot{c} wron a un ton s a so \dot{w} r s in \dot{c} pro ra an s orr t In \dot{c} s pap r w on suss \dot{c} s two as s nton \dot{c} pro ra at \dot{c} n or \dot{c} s pap r \dot{w} s an a p \dot{w} r \dot{c} s vow un ton ts is orr t an a so s orr t a so \dot{w} r s is in \dot{c} un ton but t s n orr t a in \dot{c} un ton asc_{-} \dot{c} is that a so orr t but \dot{c} s on a s \dot{c} wron ar u nt

5.1 Identifying a Call to a Function

Dur n \dot{t} bu n pro ss \dot{w} n v r E \vec{t} Y tr s to bu \dot{t} urr nt a t.v un t.on CAF or \dot{t} urr nt a t.v oa CAG t. t. t. t. st \dot{t} s \dot{w} \dot{t} r \dot{t} CAG s a tua p nt b \dot{t} CAF or

5.3 The Activation of the New Call

5.4 Dealing with a Wrong Function Call

L'È tas or È a un ton s r nt ro È urr nt a tv oa CAG an È pan r pr s nt n ts tas s as ov r È un ton È n È s ans t at È urr nt a to È un ton s wron È stu nt a a r nt un ton In È s as E DY ts È orr spon n a an r ov s ro È sarta pans u or parta instant at È at sav b n ntro u b È s a s n t o par s È CAG w È È nown tas so un tons to In out w so t a un ton w s so u to p nts è sa tas as È CAG L tons su s a un ton c n t n rat s a n w a to c at un ton w s so u b a Hav n on È at È r st o pro ss w ont nu as s r b abov It s word str ss n È at w n E DY o at s È bu tr pars t as w s r par s on at È sur a p an v an E DY o s not on m ts w È p a o a asp to su r pars s at s pr s nt n È r pars to stu nts an tutor n È s to t tutor n o u or an I È at w p o E DY as ts o an prt o u

6 Experimenting with EMILY

av b nt st_n E IFY on r a stunt. F pro ra s In or r to ot sw av ta na orpus or stunt pro ra s s pro ra sw r wr.tt n to so v to probe or a in a ... In t art, - to an Ita an noun at stota a vn Ita an noun, t r ... ts n r an a an appropriat ... In t art, - to to ront or to noun r ar ... r n trues or sp ... n a t p or n r r ar a so pt on nouns to t s rues an t s ar provident stunts s pro ra s ar wr.tt n b stunts we o too an r ... un tona pro ra ... n ours ... n autun as t r... Irst ass, n nt ns t ts t...

8 A sample program

```
val masc_fem_exc_list = [
("ambiente", true), ("mano",
                                        false),
("animale",
                 true), ("bestiame",
                                            true),
("animale", true), ("bestiame",
("piazzale", true), ("brioche",
("comunista", true), ("sale",
                                            false),
                                            true),
                                           true),
false),
                 true), ("totale",
("sole",
                false), ("chiave",
("carne",
("mare",
                                           false),
                 true), ("radio",
                true), ("pane",
("mese",
                                            true),
                 true), ("turista", true),
("nome",
               true), ("fine",
("paese",
                                            false),
("legge",
                 false), ("ponte",
                                            true),
("piede",
                true), ("camice", true),
false), ("automobile", false),
("moto",
("biro", false), ("alce", true),
("programma", true), ("crisi", false),
("stazione", false)];
fun is_vowel char = member char (explode "aeiou");
fun fem_def string = if is_vowel(hd(explode string)) then
                            "l'"^string
                      else "la "^string;
fun masc_def string = if is_vowel(hd(explode string)) then
                             "l'"^string
                         else
                       if "s" = hd(explode string) and also
                             not(is_vowel string) then
                                              "lo "^string
                       else if "z" = hd(explode string) then
                             "lo "^string
                       else "il "^string;
exception Unknown_gender
fun sgender x = case last(explode x) of "o" => true
                | "a" => false
                 | _ => raise Unknown_gender;
exception Unknown_word
fun except (word,x) = if (mem x (word,true)) then true
                   else if (mem x (word, false)) then false
                    else raise Unknown_word;
fun ggender (noun,excptlist)
    = except(noun,excptlist) handle ? => sgender noun;
```

singdef "banca";

9 Summary

In this pap r w s this to ovra strutur of our int s in the in s st for stunt. For or s in s uss its built approale or single unition and utperformance or s uss how E IFY t ts a a with a wron ar u intan a wron a to a function and how it in s subbus

ar pr. nt.n w.t E IFY's apab...t. son ra-stu nts pro ra s In t.s r ar w av .n u a sa p-orsu pro ra s.w? r a pro ra ons.sts or at - ast ? t un t.ons ... nat t utur wor w? r w ar orn to n ra-z t a opt bu .n approa ? or E IFY to a-w.t ot r as s.w? a o ur w? n bu .n ut.p-un t.on pro ra s

3.3 Incorporation of alternating learning modes

Kar o_{Π} \dot{t} Aransforina part a - struturbrain into a rativinBavoraanBrancncsssssssssar sar sarD \dot{t} utsss</td

In A Jonat an How Jos p' A oo, s, E' t 't Hous ap rs_r Gra uat s arc nt Contv Co putn c nc s at uss \neq n.v. rs.t. o, uss 200° o Contv Co putn n s. Br. 2 ton K, \forall s ar 2 aptr C, \forall

An Application of Artificial Intelligence Techniques to a Consumer Software Product

Ian Cullimore ianc@cogs.susx.ac.uk

School of Cognitive & Computing Sciences University of Sussex Brighton BN1 9QH

Abstract An p ntation is is use $\vec{w} \cdot \vec{r} \cdot \vec{t}$ applied at on $o_{\vec{t}}$ Art

6 Conclusions

References

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In A Jonat'an How Jos p' A oo, s, E' t 't Hous ap $rs_{f'}Gra$ uat s arc'nt Contv Co putn c nc's at uss \neq n.v. rs.t. or uss , 'ooor Contv Co putn n s. Br. 'ton K, \P s ar 's appr C, \P

Multimedia interfaces and anaphora resolution

Marco Rocha marco@cogssusx.ac.uk

School of Cognitive & Computing Sciences University of Sussex Brighton BN1 9QH

Abstract n wa to tr to ov ro t ______nut_sinvo v __n anap?orar so ut on w? n s. n.n natura an ua __nt r_a sisto bu __ a apab__t or ontro b t us r__nto t? int r_a ? us r and us ass ss w? t rt ______nt r_a ____s int rpr tin anap?or, r _____r n s orr t ______ut__ at ?no o orr rs n w possib__t sto int rat su ? ontro b _____nt r t us r ______ba or o? r n b tw n t? urr nt input an t? on o.n _____s ours A_t r a n ra _____s ussion or att rs on rnin t? _____nt ration or v.sua an _____s ours in or a ton t? pap rw_____rs n two _____nt pts to us u t_____at ?n.qu s as sr.b abov It w_____ n is usspart, u ar t? orn asp ts or anap?orar so ut on w? ? . ?t b For instan , in natura - an ua assist raple s s v ra p. tur s an b asso i at with a sin - s n t n , b aus pr suppositions ar a rat or T in natura - an ua with a ontain ris pr suppos in t s nt n b ow

' w_n _s on t tab

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an point to a r proution of a r s o an as quistions sub as t^2 on **b** ow with t^2 appropriat r spons

20.5 \$

a onna

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3 Two suggestions

n _____n u t prob w.t nt ont to anap or ar souton.s. nt ____n r __r nts w 2 ar 2 un s or __s ours u 2 2 un s var _n - n t but t ar not un r qu nt qu t on 2 anap or t p. a us or t s _____ or r ___ r n ar t onstrat v s t s an t at a t ou 2 t p rsona pronoun t .s po ______ or t s or o anap or r _____ r n at t _____ s A s st wou 2 av _____ t a -____ t o t r _____ n w t r t r _____ r nt s an ob t pr ss b a noun p ras, or a ______ s ours 2 un 2 s a b a a ot as r ______ t us r _____ s p t to us a po______ v to _____ nt ____ ob ts r _____ r r to 2 n v r no po______ po_____ r nt _____ s not an ob t but a ______ s ours 2 un

wo _____nut_spirs.st wvr > ______nston_st at to us r a o as.ona-- not point to an to _n ______nt sr n_nspitort at to at r r ntint n______sanob t > s ______t b ovro b a ______n a pro ur w >______ wou - n rat a natura - an ua ssa w n v rt o onstrat.v pronouns ar us without asso_at on to point n______ s on _s or ours to ______t pr __s ____s ours > un r r r to on to t p or anap-oral s as rtain A ______ ba o u wou > av to r - on u - pro ss pr ______n s ours ______n or at on to n rat a r r nt an ______ at It wou b of n n______s sar to pr s nt su ar s ontain n to _______n s ours as r so ut on options to to us r F ba _______n or to r or anap-oral n ut ______ ant r a s - ar ______ an s urt r s ar > ______

's on probe ar o o at ons ontain anapeors sub as t at s t or t at s t' t. It is oft n as r to pross sub r r n, s as units an tells is rtain tru in tell as o_{1} tell inston, with s parat r r nts or t at an term r ar read tell or r t answ r A is to r sub o o at ons with the proproducts or r soution a b r at a trappropriat r a an ual or pus invist at ons ub is st would also provide st a with tell on or is our sources and or pus invist at ons ub is st would also provide st

4 Conclusion

a or o un at n s st _n r n s on rn _n _s ours pro ss_n to t us r a o a on wa to as t bur no anap orar so ut on _n natura - an ua un rstan _n s st s It _s _ portant to not , ow v r t at t _s bur n annot b s_ p - s _ t to t us r as ? _s or ? rr spons_b _ t B _ or t a v nt or ut _ as st s t _s wou b qua tor tu

- Kv.tt, .s.on pross.n an natura an ua pross.n .tor.a $Art^{2}c^{2}a Int^{2}nc$ $v^{2}w_{r}$ a. J.G. Pap.ro. C Int. ... nt ut. .a. nt r.a. t Pnoo In Int² nt s r Int r ac s A ... son s
- ua-a.n., An .nv st. at.on .nto to on s ant. so, an ua an v.s.on Art c'a Int nc v w u ...van. J Intro u t.on In

In A Jonat'an How Jos p' A oo, s, E' t 't Hous ap $rs_{f'}$ Gra uat s arc nt Contv Co putn c nc's at uss \neq n.v. rs.t. o, uss jooo, Contv Co putn n s. Br. jton, K, \P s ar j appr C, \P

Reconstruction of the neuronal network underlying feeding behaviour in the pond snail *Lymnaea stagnalis*

Stephen Dunn stephend@cogs.susx.ac.uk

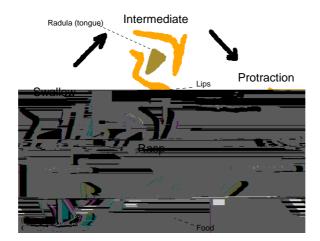
Sussex Centre for NeuroscienceCOGSUniversity of SussexUniversity of SussexFalmerFalmerEast SussexEast SussexUKUK

1 Introduction

I patt rn n ratin n ura ir utr un roin rit it in biaviour nit pon sna. Ly na a sta na sis an a an at orit n uro too a a stu oran ntr boo an ura n twor I a usin o put room to arn or about it is ans, sun roin to n ration of tisrit it is a nation of siswor is tain pa in or aboration with anot rapproaid in with the rout is short or or to so a not room to so and the rapport is not room to so an trop soon a not room to so a not ro

2 Feeding Behaviour

Ly na a sa brows n' rb vor t'at son sub r a a n' sor oat n v tat on Dur n r n t' bu a asspror sast rot p s r sor t' t' ov nts as p t nt' artoon sown n n u ' s sr p at or u r so sast an a ov sov rt' oo substrat, t p a ov n ts' a ro s to s ' ov nts w' r sut n oo b n s oop nto t' out an swa ow a b v up nto our an p'as s t'r a tv, an on ur n w' ' t' us u atur sat r st In v vo a' s t p a s t p a s on s n ur at on ' t'r a tv p'as sor t' r' t' an b su ar s as p o ows An n '

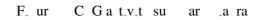


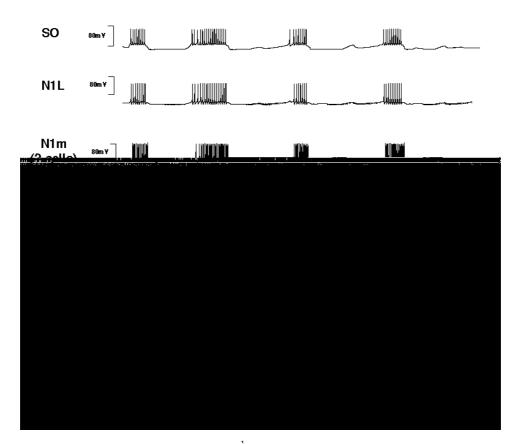
F ur Cartoon ross s ton p. t.n t bu a ass ov nts nt tr a t.v b avourap as s. p. us t int r at r st p as KEY: ar arrows n at t s qu n o_{t} t b avoura s a arrows n at ov nts o_{t} bu a ass is artoon s on ant as a s. p. r pr s ntation an as sub s t ns.v b avoura wor un r n t pro t

3 Electrophysiology

C -bo s n Ly na a ar t p. a - ar an r a - int tab ro on an a to t n t u tor u ar o our n an poston n t an a In a ton t nu b ro - s nvo v n t s r ut s r at v - s a - i s a ts av a t poss b to at or s n ar a t - s nvo v t r s napt onn t v t an π n i ara t r st s n r n t - n b avour s an os - ator r u to nt r u ros with n rat s t rit t - patt rn r.v.n t - a t vat on o t oton urons i rit t - output app ars to b a o - t v prop rt or t n twor rat r t an u to t a t on or as n - pa a r - In a t on t s a







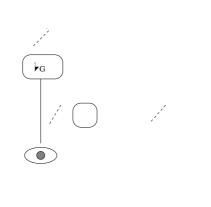
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The Role of Neural Activity in the Development of the Cat Visual System

Stephen Eglen stephene@cogs.susx.ac.uk



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References

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2 Outline of the work

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Whole Cognizers, Phenomenology, and Artificial Life*

Ronald Lemmen ronaldl@cogs.susx.ac.uk

School of Cognitive & Computing Sciences University of Sussex Brighton BN1 9QH

Abstract v_w that on ton ust b r pr s ntational s a ons quin of the Cart sign assumption that the ntal and the at right around a ntal opposite of a debin r I w ta in an bo to or a unit, rather than a union on the sign book of r quit in right row at this usual tains to b. Co putational the original ust sign and n uros n ar right as or on the sign sign product or art that an thoo

1 Introduction

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1.1 Representationalism is Cartesian

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3 Merleau-Ponty, Embodiment, and Experience

3.1 The Mind-Body Unity

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3.3 Taking Experience Seriously

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Creativity in Writing

Rafael Perez y Perez rafaelp@cogs.susx.ac.uk

School of Cognitive & Computing Sciences University of Sussex Brighton BN1 9QH

1 Introduction

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2 Hypothesis and Research Questions

3 Antecedents

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In A Jonat an How Jos p A oo, s, E' t 't Hous ap rs_{t} Gra uat s arc nt Contv Co put n c nc s at uss * n.v rs.t or uss 200or Contv Co put n n s. Br. 2 ton K, 4 s ar 2 ap C, 4 tè b st no or a tè no stè at ou poss b dav b nr vant to tè or rno de s a s to a nra-sation about prt ts an infor at onr tr va s st stè at in or r to tr in dow a ssible a no or ou nt sour b, it is no ssar to ant i pat a tè de ru stan s in which a us rwie want to or no to a ssite no or ou nt As revan is a sur intres or a us rs infor at on no te sour b at the o at on or a no in a prt torte in in or a In a o b n ______nor at on r tr va an > p rt ts st __a o to ou nts sou > av an n or at on ont ntr pr s ntat on How v r t s not n ssar. to as to at a to ou nts w... b or an s ______nto a > p rt t stru tur, or to at to r w...b on on > p rt t stru tur In a ass.v > p rt ts st _______ts un = to at an autor w...> av a - n o pass.n now o to o - to n o o u nts so to at w n to autor r at s an w no to r ______s a uarant to at to no w...b - n to a - oto r asso at no s an v. v rsa > at s or - - to > app n st at to autor w... nt... to stappropriat p a to o at to no ______ v n to autors now o rso o a topo o ______

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4 Discussion

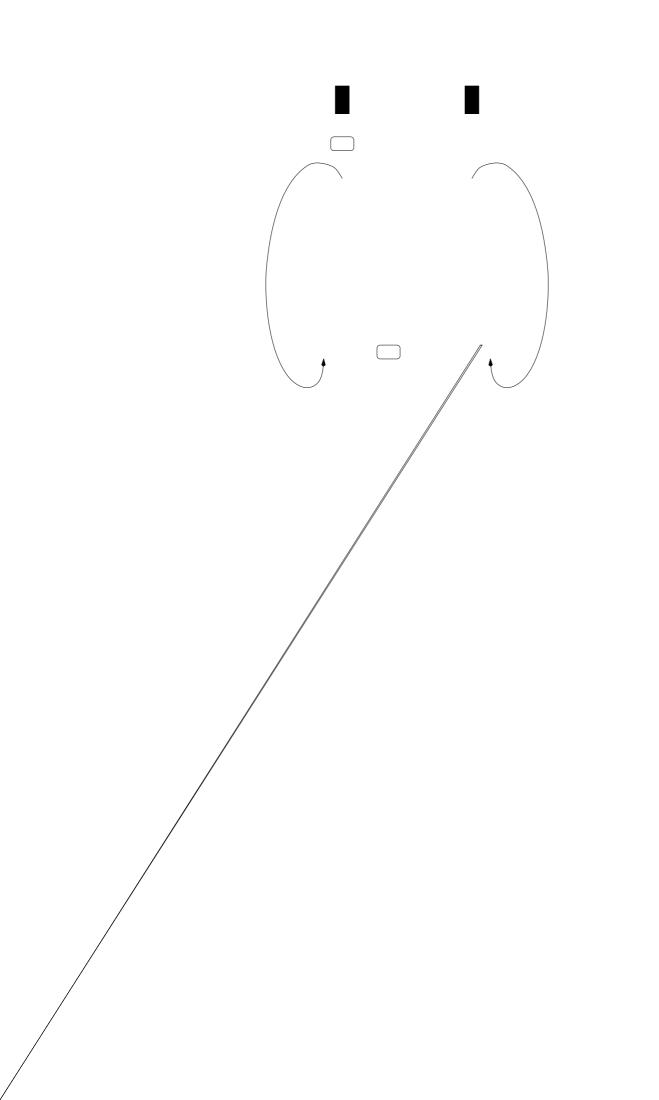
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An Evolved Dynamical Electronic Robot Control System

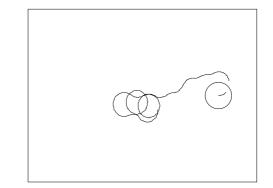
Adrian Thompson adrianth@cogs.susx.ac.uk

School of Cognitive & Computing Sciences University of Sussex Brighton BN 1 9QH





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Closing

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Showtree, the Next Generation

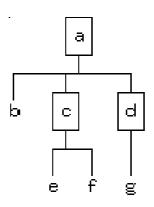
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School of Cognitive & Computing Sciences University of Sussex Brighton BN1 9QH

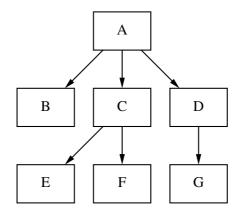
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1 Introduction

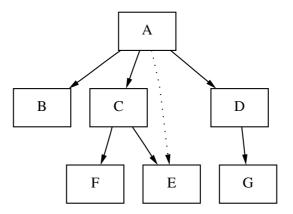
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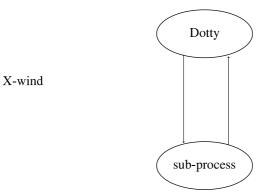
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3.1 Commands to Dotty

```
define showtree_to_dotty ( list ) -> name ;
;;; This procedure takes input in the form of
;;; showtree, and converts it to a series of
;;; output statements, that model the input to
;;; dotty. Preamble and postamble are ignored.
;;; list is the input list
;;; name is named head of the list
    lvars list, name ;
;;; declare head and tail of list
;;; and loop iterator
    lvars _hd, _tl, item ;
;;; if input is just an element, use this as the name
    if atom ( list ) then
        list -> name ;
    else
;;; split the list into head and tail
        dest (list) -> _tl -> _hd;
        if head is an element, then
;;;
        if atom ( _hd ) then
            name the head as given
;;;
            _hd -> name ;
        else
            generate a new node for the unnamed element
;;;
            gensym ( "void" ) -> name ;
            and use the list as the list's tail
;;;
            list -> _tl ;
        endif ;
        for item in _tl do
            find the name of the element, and print it
;;;
            lvars name2 = showtree_to_dotty ( item ) ;
            printf ( '%P -> %P\n', [% name, name2 %] ) ;
        endfor ;
    endif ;
enddefine ;
           F. ur Bas_ A or t > owtr _nput to Dott s_nput
```