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Theoretical Computer Science

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Preface

This special issue is dedicated to Professor Juhani Karhumäki on the occasion of his 60th birthday on August 20th (2009). The issue consists of 24 original contributions from leading researchers in Juhani's fields of interest within mathematics and theoretical computer science. The articles in this issue went through a severe refereeing process. As guest editors we are happy that the special issue consists of contributions of high quality by researchers who are Juhani's friends and colleagues.

Juhani's merits are all too numerous to be described exhaustively in this short preface. We merely mention some of them which are characteristic for his professional and personal qualities. To begin with, he is very dedicated to the department and his research group in Turku. Indeed, he has served many years as the head of the mathematics department remaining highly productive in research, and he has inspired many Ph.D. students as a teacher and supervisor. He is an editor of several journals, a member of the EATCS council, a member of Finnish Academy of Science and Letters, and a member of Academia Europaea. He has served on numerous program committees, and has given many invited talks at prestigious conferences. He was instrumental in organizing important conferences and workshops, e.g., during this millennium he organized ICALP'04, DLT'07 and WORDS'03 in Turku, all of which are among the top conferences in theoretical computer science.

Juhani's first scientific contributions were in L-systems and formal power series, two thriving research areas of automata theory in the 1970s, that raised many challenging problems, with some still open today. Most of his contributions during the last three decades have dealt with algorithmic decidability, combinatorics on words, and automata theory. His papers have been very influential in shaping research in these areas, and his list of publications contains many gems of lasting nature. Just to give an impression of his influence, we mention that Juhani was referred to about 460 times in Lothaire's handbook "Algebraic Combinatorics on Words" (Cambridge University Press, 2002).

Juhani was the second scientist to receive the *Kudlek award* for giving five full talks in ICALP conferences. He is currently the third most frequent speaker of the ICALP conference series; the fractional number of papers, which is counted relative to the number of co-authors, is impressive: $9\frac{7}{60}$! He is a very inspiring scientific collaborator: this is witnessed by the count of 57 co-authors in the list of his publications.

Juhani's dearest hobby is bird banding, as can be guessed from his picture in this issue. This hobby requires patience, strong nerves, and a great deal of physical fitness, as banding often requires climbing high trees to reach the nests. He was chosen as the birdbander of the year 1989 in Finland, which is a really impressive distinction as bird banding is very popular in Finland. Since 1967 Juhani has banded over twelve thousand birds of more than a hundred different species – later in this issue we include detailed statistics of his banding records. Although seemingly unrelated, Juhani's bird banding and research share one common feature: both happen on a very high level. When Juhani reaches a hawk's nest at the top of a very high tree, he surely gets a sharp bird's eye view of whatever he is working on – many of his spectacular results must have been born this way.

We thank the authors and the referees for their efforts to get this issue ready in time for Juhani's birthday. Many thanks are due to Dr. Arto Lepistö for compiling the list of Juhani's publications. Also, special thanks are due to the editor-in-chief of TCS-A, Professor Giorgio Ausiello, as well as to Mick van Gijlswijk and Ioannis Havoutis from the editorial office, for their kind and valuable help during the editorial process. For the years to come, we wish Juhani happiness in life, and continuing success in science and bird banding.

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Bird banding of Juhani Karhumäki

The below list gives the number of individuals of each species of birds that Prof. Juhani Karhumäki banded between 1967 and 2008. The list is arranged according to different orders of birds. The data for 1974–2008 is taken from the official records, while for 1967–1973 it was collected from Juhani's personal notes.

| | |
|--|------|
| STRIGIFORMES (OWLS) | |
| Eagle Owl, <i>Bubo bubo</i> | 665 |
| Tengmalm's Owl, <i>Aegolius funereus</i> | 821 |
| Long-eared Owl, <i>Asio otus</i> | 49 |
| Eurasian Pygmy Owl, <i>Glaucidium passerinum</i> | 65 |
| Tawny Owl, <i>Strix aluco</i> | 98 |
| Ural Owl, <i>Strix uralensis</i> | 1 |
| ACCIPITRIDAE (HAWKS, FALCONS, OSPREY) | |
| Goshawk, <i>Accipiter gentilis</i> | 1401 |
| Sparrowhawk, <i>Accipiter nisus</i> | 831 |
| Common Buzzard, <i>Buteo buteo</i> | 337 |
| Marsh Harrier, <i>Circus aeruginosus</i> | 52 |
| Honey Buzzard, <i>Pernis apivorus</i> | 15 |
| Merlin, <i>Falco columbarius</i> | 2 |
| Hobby, <i>Falco subbuteo</i> | 52 |
| Kestrel, <i>Falco tinnunculus</i> | 74 |
| Osprey, <i>Pandion haliaetus</i> | 757 |
| ANSERIFORMES (DUCKS, GEESE, SWANS) | |
| Mallard, <i>Anas platyrhynchos</i> | 151 |
| Common Teal, <i>Anas crecca</i> | 1 |
| Garganey, <i>Anas querquedula</i> | 1 |
| Goldeneye, <i>Bucephala clangula</i> | 9 |
| Canada Goose, <i>Branta canadensis</i> | 3 |
| Whooper Swan, <i>Cygnus cygnus</i> | 1 |
| Common Scoter, <i>Melanitta nigra</i> | 1 |
| PICIFORMES (WOODPECKERS) | |
| Great Spotted Woodpecker, <i>Dendrocopos major</i> | 9 |
| Lesser Spotted Woodpecker, <i>Picoides minor</i> | 8 |
| Black Woodpecker, <i>Dryocopus martius</i> | 259 |
| Grey-headed Woodpecker, <i>Picus canus</i> | 112 |
| Three-toed Woodpecker, <i>Picoides tridactylus</i> | 3 |
| Eurasian Wryneck, <i>Jynx torquilla</i> | 124 |
| PASSERIFORMES (SONGBIRDS) | |
| Raven, <i>Corvus corax</i> | 924 |
| Hooded Crow, <i>Corvus corone cornix</i> | 43 |
| Jackdaw, <i>Corvus monedula</i> | 88 |
| Magpie, <i>Pica pica</i> | 25 |
| House Sparrow, <i>Passer domesticus</i> | 3 |
| Coal Tit, <i>Parus ater</i> | 161 |
| Blue Tit, <i>Cyanistes caeruleus</i> | 297 |
| Siberian Tit, <i>Poecile cinctus</i> | 1 |
| Crested Tit, <i>Lophophanes cristatus</i> | 20 |
| Great Tit, <i>Parus major</i> | 1285 |
| Willow Tit, <i>Poecile montanus</i> | 59 |
| Reed Warbler, <i>Acrocephalus scirpaceus</i> | 9 |
| Sedge Warbler, <i>Acrocephalus schoenobaenus</i> | 81 |
| Skylark, <i>Alauda arvensis</i> | 1 |
| Tree Pipit, <i>Anthus trivialis</i> | 40 |
| Red-throated Pipit, <i>Anthus cervinus</i> | 1 |
| Linnet, <i>Carduelis cannabina</i> | 10 |
| Common Rosefinch, <i>Carpodacus erythrurus</i> | 2 |
| Common Treecreeper, <i>Certhia familiaris</i> | 30 |
| Greenfinch, <i>Chloris chloris</i> | 5 |
| Dipper, <i>Cinclus cinclus</i> | 20 |
| House Martin, <i>Delichon urbicum</i> | 6 |

| | |
|---|------|
| Yellowhammer, <i>Emberiza citrinella</i> | 29 |
| Rustic Bunting, <i>Emberiza rustica</i> | 1 |
| Reed Bunting, <i>Emberiza schoeniclus</i> | 25 |
| Robin, <i>Erithacus rubecula</i> | 5 |
| Pied Flycatcher, <i>Ficedula hypoleuca</i> | 1195 |
| Barn Swallow, <i>Hirundo rustica</i> | 7 |
| Spotted Flycatcher, <i>Muscicapa striata</i> | 88 |
| Northern Wheatear, <i>Oenanthe oenanthe</i> | 11 |
| Chaffinch, <i>Fringilla coelebs</i> | 22 |
| Eurasian Jay, <i>Garrulus glandarius</i> | 8 |
| Siberian Jay, <i>Perisoreus infaustus</i> | 4 |
| Red-backed Shrike, <i>Lanius collurio</i> | 19 |
| Woodlark, <i>Lullula arborea</i> | 1 |
| Thrush Nightingale, <i>Luscinia luscinia</i> | 5 |
| White Wagtail, <i>Motacilla alba</i> | 86 |
| Yellow Wagtail, <i>Motacilla flava</i> | 28 |
| Nutcracker, <i>Nucifraga caryocatactes</i> | 1 |
| Redstart, <i>Phoenicurus phoenicurus</i> | 62 |
| Chiffchaff, <i>Phylloscopus collybita</i> | 58 |
| Willow Warbler, <i>Phylloscopus trochilus</i> | 98 |
| Wood Warbler, <i>Phylloscopus sibilatrix</i> | 18 |
| Dunnock, <i>Prunella modularis</i> | 13 |
| Bullfinch, <i>Pyrrhula pyrrhula</i> | 44 |
| Whinchat, <i>Saxicola rubetra</i> | 31 |
| Starling, <i>Sturnus vulgaris</i> | 155 |
| Blackcap, <i>Sylvia atricapilla</i> | 2 |
| Garden Warbler, <i>Sylvia borin</i> | 6 |
| Common Whitethroat, <i>Sylvia communis</i> | 13 |
| Lesser Whitethroat, <i>Sylvia curruca</i> | 27 |
| Wren, <i>Troglodytes troglodytes</i> | 1 |
| Redwing, <i>Turdus iliacus</i> | 89 |
| Blackbird, <i>Turdus merula</i> | 7 |
| Song Thrush, <i>Turdus philomelos</i> | 85 |
| Fieldfare, <i>Turdus pilaris</i> | 18 |
| Mistle Thrush, <i>Turdus viscivorus</i> | 24 |
| CHARADRIIFORMES (GULLS, SANDPIPERS) | |
| Herring Gull, <i>Larus argentatus</i> | 2 |
| Common Gull, <i>Larus canus</i> | 26 |
| Lesser Black-backed Gull, <i>Larus fuscus</i> | 3 |
| Black-headed Gull, <i>Larus ridibundus</i> | 1 |
| Common Sandpiper, <i>Actitis hypoleucos</i> | 21 |
| Curlew Sandpiper, <i>Calidris ferruginea</i> | 12 |
| Broad-billed Sandpiper, <i>Limicola falcinellus</i> | 1 |
| Wood Sandpiper, <i>Tringa glareola</i> | 108 |
| Green Sandpiper, <i>Tringa ochropus</i> | 11 |
| Common Redshank, <i>Tringa totanus</i> | 11 |
| Spotted Redshank, <i>Tringa erythropus</i> | 1 |
| Dunlin, <i>Calidris alpina</i> | 157 |
| Little Stint, <i>Calidris minuta</i> | 8 |
| Temminck's Stint, <i>Calidris temminckii</i> | 56 |
| Common Snipe, <i>Gallinago gallinago</i> | 84 |
| Curlew, <i>Numenius arquata</i> | 5 |
| Red-necked Phalarope, <i>Phalaropus lobatus</i> | 7 |
| Ruff, <i>Philomachus pugnax</i> | 102 |
| Woodcock, <i>Scolopax rusticola</i> | 32 |
| Common Tern, <i>Sterna hirundo</i> | 39 |
| Lapwing, <i>Vanellus vanellus</i> | 27 |
| Ringed Plover, <i>Charadrius hiaticula</i> | 14 |
| Little Ringed Plover, <i>Charadrius dubius</i> | 25 |
| GALLIFORMES (GAMEFOWL) | |
| Capercaillie, <i>Tetrao urogallus</i> | 15 |

| | |
|---|--------------|
| Hybrid of capercaillie and grouse | 1 |
| Grey Partridge, <i>Perdix perdix</i> | 47 |
| COLUMBIFORMES (DOVES AND PIGEONS) | |
| Stock Dove, <i>Columba oenas</i> | 707 |
| Wood Pigeon, <i>Columba palumbus</i> | 19 |
| CORACIIFORMES | |
| Kingfisher, <i>Alcedo atthis</i> | 1 |
| APODIFORMES | |
| Swift, <i>Apus apus</i> | 79 |
| PODICIPEDIFORMES (GREBES) | |
| Great Crested Grebe, <i>Podiceps cristatus</i> | 1 |
| CAPRIMULGIFORMES | |
| European Nightjar, <i>Caprimulgus europaeus</i> | 11 |
| CUCULIFORMES | |
| Common Cuckoo, <i>Cuculus canorus</i> | 2 |
| GRUIFORMES (CRANES) | |
| Common Crane, <i>Grus grus</i> | 13 |
| Coot, <i>Fulica atra</i> | 5 |
| Total | 12314 |