

Curriculum Vitae Vinzenz Rudolf von Tscharner.

Tele +1 403 949 3714 and +41 81 8500307; Email vincent@kin.ucalgary.ca

PERSONAL INFORMATION.

Born January 19th, 1947 in Berne, Switzerland. Swiss citizen.

Married to Dr. phil. Michaela Aue since 1968.

Languages: German, English and French.

CURRENT ACTIVITY.

- (a) Adj. Associate Professor, Faculty of Kinesiology, University of Calgary. The current research projects include the development of wavelet based filtering methods for time series such as electromyographic signals recorded from muscles or acceleration signals from body vibrations. Pattern recognition methods are currently adapted to recognize features of movements in human motion and to correlate these features with kinematic data.
- (b) Consultant (Volunteer) for data analysis and data mining for students and post docs in the Human Performance Laboratory
- (c) Self-employed consultant in Biophysics.

SCIENTIFIC ACTIVITY.

1978 - 1979 Post Doctorate position at Oxford University (Royal Society), Development of "Condensed - Phase - Radioluminescence" technique. This method was used to monitor agonist binding to cell receptors.

Collaboration as consultant to ICI in Great Britain

1980 - 1981 Post Doctoral research affiliate at Stanford University, California, USA Dep. Biochemistry.

1981 - 1982 Assistant at the Biocenter in Basel, Switzerland.

1982 - 1992 Research associate at the Theodor Kocher Institute in Berne, Switzerland

1992 - 1997 Self-employed consultant.

1997 - 1999 Adj. Assistant Professor, Human Performance Laboratory, Faculty of Kinesiology, University of Calgary. Project Leader "Electromyographic measurements of muscle activity on radiaesthetically defined sites in comparison to neutral zones" funded by the Swiss National Science Foundation the project was renewed for two more years.

2000 - 2009 Adj. Associate Professor, Category A Supervisor at the University of Calgary.

Summary of activities:

New methods for the analysis of electromyographic measurements of muscle activity were developed and applied. These methods include wavelet analysis, pattern recognition, signal processing. The time/frequency analysis using not linearly scaled wavelets became the method of choice in many applications. The wavelet analyzed myoelectric

signals represent a new way for observing the muscle activity of individual muscles and/or of sets of muscles. The method has been expanded and is also used for the analysis of vibrations and mechanomyograms. The intensity patterns that result from the wavelet analysis form an ideal input data format for pattern recognition methods. Various pattern recognition methods have been tested lately including support vector machines. The combination of wavelet analysis and pattern recognition forms a powerful tool for analyzing data resulting from dynamic processes. Some of the processes that have been analyzed include muscle activity patterns resulting from a) walking of patients suffering from osteoarthritis, b) walking pre- and post-ankle replacements, c) running in different shod conditions, d) free style ski jumping and e) patterns resulting from patients suffering from carpal tunnel syndrome. The range of possible applications is large and is currently being explored. The method represents a milestone for the investigation of muscle activation patterns.

EDUCATION:

1968 - 1974 Study and final Diploma in applied Physics, Mathematics and Astronomy at the University of Basel, Switzerland.

Supervisor of practical work of undergraduates.

1975 - 1977 **Doctorate in Biophysics** (Ph.D.) at the Biocenter in Basel with Prof. G. Schwarz. Title "Bindungsstudien von Acridinorange an Poly- und Oligoriboadenylylsäure." Purification and separation of oligoriboadenylic acid. Theoretical and practical work on cooperative binding of acridin orange to these oligonucleotides.

Assistant lecturer to Prof. G. Schwarz. Supervisor for experimental courses in biophysics for graduate students.

PUBLICATIONS

Total 54 of which 53 were refereed.

Citations 2,637 (17 August, 2009, Web of Science® Cited Author=(von Tscharner V* OR vontscharner V OR Tscharner V) AND Databases=SCI-EXPANDED, SSCI, A&HCI.)

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2. Huber C, Göpfert B, Kugler P, von Tscharner V. The effect of sprint and endurance training on EMG signal analysis by wavelets. The Journal of Strength & Conditioning Research. 2009 in press.
3. von Tscharner V. Spherical classification of wavelet transformed EMG intensity patterns. J Electromyogr Kinesiol. 2008. doi:10.1016/j.jelekin.2008.07.001

4. von Tscharner V, Nigg BM. Point: spectral properties of the surface EMG can characterize/do not provide information about motor unit recruitment strategies and muscle fiber type. *J Appl Physiol*. 2008 Nov;105(5):1671-3.
5. Croft JL, von Tscharner V, Zernicke RF. Movement variability and muscle activity relative to center of pressure during unipedal stance on solid and compliant surfaces. *Motor Control*. 2008 Oct;12(4):283-95.
6. Travis W. Beck, Vinzenz von Tscharner, Terry J. Housh, Joel T. Cramer, Joseph P. Weir, Moh H. Maleke and Michelle Mielke. Time/frequency events of surface mechanomyographic signals resolved by nonlinearly scaled wavelets. *Biomedical Signal Processing and Control*. 2008 3(3) 255-266.
7. Barandun M, von Tscharner V, Meuli-Simmen C, Bowen V, Valderrabano V. Frequency and conduction velocity analysis of the abductor pollicis brevis muscle during early fatigue. *J Electromyogr Kinesiol*. 2007 Nov 4; [Epub ahead of print]
8. Valderrabano V, Nigg BM, von Tscharner V, Stefanyshyn DJ, Goepfert B, Hintermann B. Gait analysis in ankle osteoarthritis and total ankle replacement. *Clin Biomech (Bristol, Avon)*. 2007 Oct; 22(8):894-904.
9. Valderrabano V, Nigg BM, von Tscharner V, Frank CB, Hintermann B.J. Leonard Goldner Award 2006. Total ankle replacement in ankle osteoarthritis: an analysis of muscle rehabilitation. *Foot Ankle Int*. 2007 Feb; 28(2):281-91.
10. Valderrabano V, Nigg BM, Hintermann B, Goepfert B, Dick W, Frank CB, Herzog W, von Tscharner V. Muscular lower leg asymmetry in middle-aged people. *Foot Ankle Int*. 2007 Feb; 28(2):242-9.
11. Valderrabano V, von Tscharner V, Nigg BM, Hintermann B, Goepfert B, Fung TS, Frank CB, Herzog W.. Lower leg muscle atrophy in ankle osteoarthritis. *J Orthop Res*. 2006 Dec;24(12):2159-69.
12. Valderrabano V, Hintermann B, von Tscharner V, Gopfert B, Dick W, Nigg BM. Muscle biomechanics in total ankle replacement. [Article in German] *Orthopade*. 2006 May;35(5):513-20.
13. von Tscharner V, Goepfert B. Estimation of the interplay between groups of fast and slow muscle fibers of the tibialis anterior and gastrocnemius muscle while running. *J Electromyogr Kinesiol* 2006, 16:188-197.
14. von Tscharner V. Goepfert B. Wirz D. Friederich N.F. Analyse der Veraenderungen von Wavelet-transformierten elektromyographischen Signalen, wie sie beim Tragen einer Kniebinde entstehen. *Biomed. Technik* 2004; 49:43-48.
15. von Tscharner V, Goepfert B, Nigg BM. Changes in EMG signals for the muscle tibialis anterior while running barefoot or with shoes resolved by nonlinearly scaled wavelets. *J Biomechanics* 2003, 36:1169-1176.

16. von Tscharner V, Goepfert B. Gender dependent EMGs of runners resolved by time/frequency and principal pattern analysis. *J Electromyogr Kinesiol* 2003; 13:253-272.
17. von Tscharner Vinzenz. Wavelets zur Analyse von Electromyogrammen. *Orthopaedie Schuhtechnik* 2002; 10:42-45.
18. von Tscharner V. Time-frequency and principal component methods for the analysis of EMGs recorded during a mildly fatiguing exercise on a cycle ergometer. *J Electromyogr Kinesiol* 2002; 12:479-492.
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23. von Tscharner V., Intensity analysis in time-frequency space of surface myoelectric signals by wavelets of specified resolution. *J Electromyogr Kinesiol*, 2000; 10(6): 433-445.
24. von Tscharner V. [Electromyographic measurement of human muscles depending on position to radiesthetically defined attraction zones compared with neutral zones] Standortabhängige elektromyographische Messungen an humanen Muskeln auf radiesthetisch definierten Reizzonen im Vergleich zu neutralen Zonen. *Forsch Komplementarmed* 1999 Feb;6 Suppl 1:53-55.
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- factor: biological equivalence between natural and recombinant neutrophil-activating factor. *Proc Natl Acad Sci U S A*. 1988 Dec;85(23):9199-203.
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